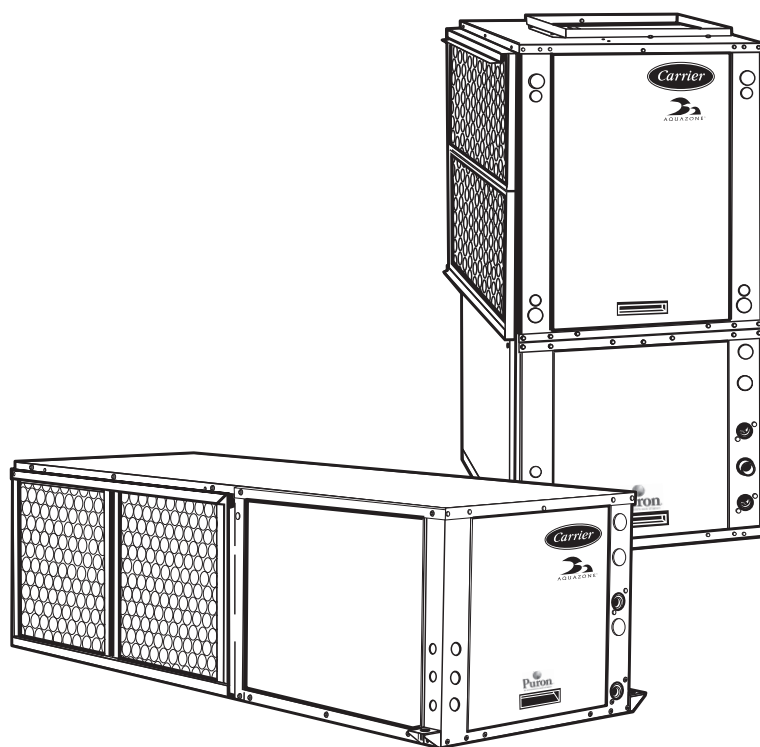




# Product Data

## Aquazone™ 50PSH, PSV, PSD006-070 Single-Stage Water Source Heat Pumps with PURON® Refrigerant (R-410A)

1/2 to 6 Nominal Tons



Single-package horizontally and vertically mounted water source heat pumps with electronic controls offer:

- Non-ozone depleting Puron refrigerant (R-410A)
- State-of-the-art electronically commutated motor (ECM) variable speed blower motor option
- Copeland scroll compressor
- Stainless steel drain pan
- Tin-plated air coil available
- Mute package for quieter operation available
- Versatility: apply to commercial boiler/cooling tower or geothermal and hybrid applications (select extended range option for use in geothermal applications)
- Performance certified to AHRI/ISO 13256-1
- Flexible and reliable multiple protocol WSHP Open controller can use BACnet<sup>†</sup>, Modbus<sup>†</sup>, N2, and LON (with a separate card) protocols for integrating energy efficiency and precise unit control
- Modulating hot water reheat (HWR) available for dehumidification

## Features/Benefits

**The Aquazone single-stage water source heat pump with Puron refrigerant (R-410A) is a high quality, efficient solution for all boiler/tower and geothermal applications.**

### Operating efficiency

Carrier water source heat pumps (WSHPs) are designed for quality and high performance over a lifetime of operation. Single-stage WSHP models with Puron refrigerant (R-410A) offer cooling EERs (Energy Efficiency Ratios) to 27.4 and heating COPs (Coefficient of Performance) to 5.9.



Well exceeds  
ASHRAE 90.1 and  
Energy Star Standards.



# Features/Benefits (cont)



All efficiencies stated are in accordance with standard conditions under ISO (International Organization for Standardization) Standard 13256-1 and provide among the highest ratings in the industry, exceeding ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) 90.1 Energy Standards.

## High quality construction and testing

All units are manufactured to meet extensive quality control protocol from start to finish through an automated control system, which provides continuous monitoring of each unit and performs quality control checks as equipment progresses through the production process. Standard construction features of the Aquazone™ units include:

**Cabinet** — Standard unit fabrication consists of heavy gage galvanized sheet metal cabinet construction designed for part standardization (i.e., minimal number of parts) and modular design. Compressor section interior surfaces are lined with 1/2 in. thick, dual density, 1 3/4 lb per cubic ft acoustic type fiberglass insulation. Air-handling section interior surfaces are lined with 1/2 in. thick, single density, 1 3/4 lb per cubic ft foil-backed fiber insulation for ease of cleaning. Insulation placement is designed to eliminate any exposed edges to prevent the introduction of glass fibers into the airstream.

Horizontal and vertical water source heat pumps are fabricated from heavy gage G90 galvanized steel with a powder coat paint finish. Compact cabinet dimensions are designed to fit tight space limitations in both horizontal and vertical configurations.

**Compressor** — Aquazone 50PS single-stage units include a rotary compressor in sizes 006-012 and a scroll compressor in sizes 018-070. Single-stage models with Puron® refrigerant (R-410A) offer a dual level vibration isolation system. The compressor is mounted on computer selected vibration isolation springs to a large heavy gage compressor mounting tray plate, which is then isolated from the cabinet base with rubber grommets for maximized vibration attenuation. The compressor has thermal overload protection and is located in an insulated compartment away from the airstream to minimize sound transmission.

**AHRI/ISO labels** — Aquazone units have AHRI (Air Conditioning, Heating, and Refrigeration Institute)/ISO, NRTL (Nationally Recognized Testing Lab), or ETL labels and are factory tested under normal operating conditions at nominal water flow rates. Quality assurance is provided via testing report cards shipped with each unit to indicate specific unit performance under cooling and heating modes of operation.

**Blower and motor assembly** — Aquazone 50PS units are available with permanent split capacitor (PSC),

high-static PSC or electronically commutated motors (ECM).

**NOTE:** The ECM blower motors are not available in 575-v units. The PSC and high-static PSC blower motors, when used with a Thermidistat™ device and/or a humidistat and the Deluxe D controls, allow for intelligent fan speed reduction to provide the IdealHumidity™ system. The ECM blower motor, when used with a Thermidistat device and/or a humidistat (and any controller), also allows for intelligent fan speed reduction to provide the IdealHumidity system. The variable-speed blower systems work in concert with the Thermidistat and/or humidistat control to remove more moisture than a standard system, making the occupants feel cool and more comfortable.

**Refrigeration/water circuit** — All units contain sealed Puron refrigerant (R-410A) circuits including a high-efficiency hermetic compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum-lanced fin and rifled copper tube refrigerant-to-air heat exchanger, reversing valve, coaxial (tube-in-tube) refrigerant-to-water heat exchanger, and safety controls including a high-pressure switch, low-pressure switch, water coil low temperature sensor, and air coil low temperature sensor.

**Filter drier** — A factory-installed reversible heat pump filter drier operates in either flow direction with low pressure drop. The filter drier core offers optimum water and acid removal abilities in addition to excellent filtration. When flow reverses, dirt already collected remains in the filter drier.

## Quiet operation

Fan motor insulation and double isolated compressor are provided for sound isolation, cabinets are fully insulated to reduce noise transmission, low speed blowers are utilized for quiet operation through reduced outlet air velocities, and air-to-refrigerant coils are designed for lower airflow coil face velocities. Additional sound mitigation can be attained with the mute package option.

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## Puron® refrigerant (R410-A)

Puron refrigerant (R-410A) is a non-chlorine based refrigerant. Puron refrigerant characteristics, compared to R-22, have:

- Binary and near azeotropic mixture of 50% R-32 and 50% R-125.
- Higher efficiencies (50 to 60% higher operating pressures).
- Non-ozone depleting potential and low global warming potential.
- Virtually no glide. Unlike other alternative refrigerants, the two components in Puron refrigerant have virtually the same leak rates. Therefore, refrigerant can be added if necessary without recovering the charge.

## Tin-plated air coils

The 50PSH,PSV,PSD units are available with an optional tin-plated air coil. This plating process will provide years of protection against corrosion from airborne chemicals resulting from modern building material out gassing and most environmental chemicals found in the air. Modern building materials such as floor coverings, paints and other materials, can “outgas” chemicals into the building air. Some of these chemicals are suspected of contributing to corrosion in the air coils found in both traditional and geothermal heating and cooling equipment. Corrosion often results in refrigerant leaks and eventual failure of the air coil, costing hundreds of dollars to replace. Studies have also shown that these air coil coatings improve moisture shedding and therefore improve a unit’s moisture removal capability resulting in a more comfortable indoor environment.

## Design flexibility

Airflow configurations for horizontal units are available in four patterns including left or right return, and left, right, or back discharge. Horizontal and downflow units are field convertible from left or right discharge to back discharge. Vertical units are available in three airflow patterns including top discharge with right or left return. Standard entering water temperature is between 60 and 95 F. Extended entering water temperature range between 20 and 120 F offers maximum design flexibility for all applications. Water flow rates as low as 1.5 gpm per ton assist with selection from a various range of circulating pumps.

Factory-installed options are offered to meet specific design requirements.

## Safe, reliable operation

Standard safety features for the refrigerant circuit include high-pressure switch, low-pressure sensor to detect loss of refrigerant, and low air temperature sensor to safeguard against freezing. Equipment safety features include water loop temperature monitoring, voltage protection, water coil freeze protection, and standard electronic condensate overflow shutdown. All safety features are tested and run at the factory to assure proper operation of all components and safety switches.

All components are carefully designed and selected for endurance durability, and carefree day-to-day operation.

The Aquazone™ unit is shipped to provide internal and external equipment protection. Shipping supports are placed under the blower housing and compressor feet. In addition, horizontal and vertical units are both mounted on oversized pallets with lag bolts for sturdiness and maximum protection during transit.

## Ease of installation

The Aquazone unit is packaged for simple low cost handling, with minimal time required for installation. All units are pre-wired and factory charged with refrigerant. Horizontal units are provided with factory-installed hangar isolation brackets. Vertical units are provided with an internally trapped condensate drain to reduce labor associated with installing an external trap for each unit. Water connections (FPT) and condensate drains (FPT) are anchored securely to the unit cabinet, eliminating the need for backup wrenches.

## Simple maintenance and serviceability

The Aquazone water source heat pump (WSHP) units are constructed to provide ease of maintenance. Units allow access to the compressor section from 3 sides and have large removable panels for easy access. Additional panels are provided to access the blower and control box sections.

The blower housing assembly can be serviced without disconnecting ductwork from the dedicated blower access panel. Blower units are provided with permanently lubricated bearings for

worry-free performance. Blower inlet rings allow removal of the blower wheel without having to remove the housing or ductwork connections.

Electrical disconnection of the blower motor and control box is easily accomplished from quick disconnects on each component.

Easy removal of the control box from the unit provides access to all refrigeration components.

The refrigeration circuit is easily tested and serviced through the use of high and low pressure ports integral to the refrigeration circuit.

## Maximum control flexibility

Aquazone water source heat pumps provide reliable control operation using a standard microprocessor board with flexible alternatives for many direct digital controls (DDC) applications including the WSHP Open and i-Vu® control system.

The Aquazone standard unit solid-state control system, the Complete C, provides control of the unit compressor, reversing valve, fan, safety features, and troubleshooting fault indication features. The Complete C control system is one of the most user friendly, low cost, and advanced control boards found in the WSHP industry. Many features are field selectable to provide the ultimate in field installation flexibility. The overall features of this standard control system include:

**50-va transformer** — The transformer assists in accommodating accessory loads.

**Anti-short cycle timer** — The timer provides a minimum off time to prevent the unit from short cycling. The 5-minute timer energizes when the compressor is deenergized, resulting in a 5-minute delay before the unit can be restarted. Thus, prevents short cycling of the compressor.

**Random start relay** — The random start relay ensures a random delay in energizing each different WSHP unit. This option minimizes peak electrical demand during start-up from different operating modes or after building power outages. The control features a 5 to 80 second random start upon start-up.

# Features/Benefits (cont)



**High and low pressure refrigerant protection** — This protection safeguards against unreliable unit operation and provides a warning for refrigerant leaking.

**Condensate overflow sensor** — The electronic sensor is mounted to the drain pan. When condensate pan liquid reaches an unacceptable level, unit is automatically deactivated and placed in a lockout condition. Thirty continuous seconds of overflow is recognized as a fault by the sensor.

**High and low voltage protection** — Safety protection for excessive or low voltage conditions is included.

**Automatic intelligent reset** — The unit will automatically restart 5 minutes after shutdown if the fault has cleared. Should a fault occur 3 times sequentially, lockout will occur.

**Accessory output** — A 24-v output is provided to cycle a motorized water valve or damper actuator with compressor in applications such as variable speed pumping arrangements.

**Performance Monitor (PM)** — This unique feature monitors water temperatures to warn when the heat pump is operating inefficiently or beyond typical operating range. Field selectable switch initiates a warning code on the unit display.

**Water coil freeze protection (selectable for water or antifreeze)** — The field selectable switch for water and water/glycol solution systems initiates a fault when temperatures exceed the selected limit for 30 continuous seconds.

**Air coil freeze protection (check filter operation)** — The field selectable switch for assessing excessive filter pressure drop initiates a fault when temperatures exceed the selected limit for 30 continuous seconds.

**Alarm relay setting** — A selectable 24-v or pilot duty dry contact provides activation of a remote alarm.

**Electric heat option** — The output provided on the controller operates two stages of emergency electric heat.

**Service Test mode with diagnostic LED (light-emitting diode)** — The Service Test mode allows service personnel to check the operation of the WSHP and control system efficiently. Upon entering Service Test mode, time delays are sped up, and the Status

LED will flash a code to indicate the last fault experienced for easy diagnosis. Based on the fault code flashed by the status LED, system diagnostics are assisted through the use of Carrier provided troubleshooting tables for easy reference to typical problems.

**LED visual output** — An LED panel indicates high pressure, low pressure, low voltage, high voltage, air/water freeze protection, condensate overflow, and control status.

**WSHP Open multiple protocol controller** — Carrier's state of the art water source heat pump multiple protocol controller is capable of communicating BACnet, Modbus, N2 and LON (with a separate card) protocols. The controller is designed specifically for Carrier's WSHPs in order to bring more features and benefits to the units such as waterside economizer control, auxiliary heat, dehumidification, etc., in addition to independent compressor and fan operation. The WSHP Open controller can be used to actively monitor and control all modes of operation as well as monitor the following diagnostics and features: unit number, zone temperature, zone set point, zone humidity set point, discharge air temperatures, fan status, stages of heating, stages of cooling, outdoor-air temperature, leaving-air temperature, leaving water temperature, alarm status, and alarm lockout condition.

The controller also provides a proactive approach to maintenance and service enabling the unit to recognize and correct operating conditions outside of recommended operating conditions avoiding the need to manually restart equipment. From a system standpoint WSHP Open controller can accept both water and airside linkage.

Condenser water linkage provides optimized water loop operation using the UC (universal controller) Open XP loop controller. Loop pump operation is automatically controlled by WSHP equipment occupancy schedules, unoccupied demand and tenant override conditions. Positive pump status feedback prevents nuisance fault trips.

Airside linkage enables the WSHP equipment to be completely integrated with the Carrier's VVT® application as a system. The WSHP Open controller responds to individual zone demands rather than average temperature conditions to provide individual temperature control in each zone.

This controller has a 38.4 kilobaud communications capability and is compatible with i-Vu® Open building automation system controls and CCN controls. The addition of the Carrier CO<sub>2</sub> sensor in the conditioned space provides ASHRAE 62-99 compliance and demand controlled ventilation (DCV). A DCV control strategy is especially beneficial for a water source heat pump system to minimize the energy utilized to condition ventilation air. In combination with energy efficient Aquazone units, DCV may be the most energy efficient approach ever developed for a water source heat pump system.

The WSHP Open multiple protocol controller is designed specifically for constant volume (CV) and variable volume and temperature (VVT®) applications. This comprehensive controls system allows water source heat pumps to be linked together to create a fully functional HVAC (heating, ventilation, and air conditioning) automation system.

## **PremierLink™ controller adds reliability, efficiency, and simplification**

The PremierLink direct digital controller can be ordered as a factory-installed option. Designed and manufactured exclusively by Carrier, the controller can be used to actively monitor and control all modes of operation as well as monitor the following diagnostics and features: unit number, zone temperature, zone set point, zone humidity set point, discharge air temperatures, fan status, stages of heating, stages of cooling, outdoor-air temperature, leaving-air temperature, leaving water temperature, alarm status, and alarm lockout condition.

This controller has a 38.4 kilobaud communications capability and is compatible with i-Vu Open building automation system controls and CCN (Carrier Comfort Network®) controls. The addition of the Carrier CO<sub>2</sub> sensor in the conditioned space provides ASHRAE 62-99 compliance and demand controlled ventilation (DCV). A DCV control strategy is especially beneficial for a water source heat pump system to minimize the energy utilized to condition ventilation air. In combination with energy efficient Aquazone units, DCV may be the most energy efficient approach ever developed for a water source heat pump system.

The PremierLink peer-to-peer, Internet ready communicating control is designed specifically for constant volume (CV) and variable volume and temperature (VVT®) applications. This comprehensive controls system allows water source heat pumps to be linked together to create a fully functional HVAC (heating, ventilation, and air conditioning) automation system.

#### **LON protocol for diverse control**

— The LON controller option is ideal when building automation requires interoperability across diverse control platforms. This LONMark™ compliant offering can operate as standalone or as a part of Local Operating

Network (LON) via the LonWorks™ FTT-10 Free Topology communication network. Factory completed pre-engineered applications specific to Aquazone water source heat pumps and digital wall sensors communicating over Sensor Link (S-Link) communication protocol completes a system of networked control.

**Humidity control —** Aquazone 50PSH, PSV, PSD units provide very good latent capacity and are an excellent choice for controlling humidity within a zone in many applications. The latent capacity of the units can be increased based on zone conditions with either the use of fan speed control and

a humidistat or with the modulating WSHP Open controller hot water reheat option. The Deluxe D controls option provides fan speed control based on relative humidity and is an effective, low-cost means of controlling humidity. For certain applications in which a significant amount of latent capacity is required, the modulating hot water reheat option is a good solution.

With the hot water reheat (HWR) option, return air from the space is cooled by air-to-refrigerant (evaporator) coil, and then reheated by the water-to-air (reheat) coil to dehumidify the air, but maintain the same space temperature (operating as a dehumidifier).

\* Sponsored by ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).

† Registered trademark of Schneider Electric.

\*\* Registered trademark of Echelon Corporation.

# Model number nomenclature



## 50PSH,PSV,PSD PREMIUM EFFICIENCY

50PSV 024 J C C 3 0 1 3 0

### Aquazone™ Single-Stage Water Source Heat Pump with Puron® Refrigerant (R-410A)

- 50PSD – Vertical Downflow Configuration (not available with HWR)  
 50PSH – Horizontal Configuration  
 50PSV – Vertical Upflow Configuration

### Size - Nominal Tons

- |             |             |         |
|-------------|-------------|---------|
| 006 – 1/2   | 024 – 1     | 048 – 4 |
| 009 – 3/4   | 030 – 2-1/2 | 060 – 5 |
| 012 – 1     | 036 – 3     | 070 – 6 |
| 018 – 1-1/2 | 042 – 3-1/2 |         |

### Airflow Configuration

Return Discharge Blower Motor

#### 50PSH Units

- |           |       |         |
|-----------|-------|---------|
| A – Right | Left  | PSC HS* |
| B – Right | Back  | PSC     |
| C – Right | Back  | PSC HS* |
| D – Left  | Right | PSC HS* |
| E – Left  | Back  | PSC     |
| F – Left  | Back  | PSC HS* |
| N – Right | Left  | ECM*    |
| P – Right | Back  | ECM*    |
| S – Left  | Right | PSC     |
| W – Left  | Right | ECM*    |
| Y – Left  | Back  | ECM*    |
| Z – Right | Left  | PSC     |

#### 50PSV Units

- |           |     |         |
|-----------|-----|---------|
| G – Right | Top | PSC HS* |
| J – Left  | Top | ECM*    |
| K – Right | Top | ECM*    |
| L – Left  | Top | PSC     |
| M – Left  | Top | PSC HS* |
| R – Right | Top | PSC     |

#### 50PSD Units

- |           |        |         |
|-----------|--------|---------|
| G – Right | Bottom | PSC HS* |
| J – Left  | Bottom | ECM*    |
| K – Right | Bottom | ECM*    |
| L – Left  | Bottom | PSC     |
| M – Left  | Bottom | PSC HS* |
| R – Right | Bottom | PSC     |

### Controls†

- 1 – PremierLink™ DDC with Disconnect  
 2 – Complete C Microprocessor Control with WSHP Open with Disconnect\*\*  
 3 – Deluxe D Microprocessor Control with WSHP Open with Disconnect\*\*  
 A – Complete C Microprocessor Control with Disconnect  
 B – Deluxe D Microprocessor Control with Disconnect  
 C – Complete C Microprocessor Control  
 D – Deluxe D Microprocessor Control  
 E – Complete C Microprocessor Control with LON with Disconnect  
 K – Deluxe D Microprocessor Control with LON with Disconnect  
 L – Complete C Microprocessor Control with LON\*\*  
 M – Deluxe D Microprocessor Control with LON\*\*  
 P – PremierLink™ DDC  
 W – Complete C Microprocessor Control with WSHP Open\*\*  
 Y – Deluxe D Microprocessor Control with WSHP Open\*\*

### Water Circuit Options

- 0 – None  
 2 – HWG Coil Only  
 5 – Internal Secondary Pump  
 6 – HWG Coil with 2.5 Gpm per Ton Auto Flow Regulator  
 7 – HWG Coil with 3.0 Gpm per Ton Auto Flow Regulator  
 8 – Auto Flow Regulator Sized for 2.5 Gpm per Ton  
 9 – Auto Flow Regulator Sized for 3.0 Gpm per Ton

### Operating Range/Sound Option

- 1 – Extended Range with 1-in. Filter Rack  
 2 – Extended Range with Mute Package with 1-in. Filter Rack  
 3 – Standard Range with 1-in. Filter Rack  
 4 – Standard Range with Mute Package with 1-in. Filter Rack  
 A – Extended Range with 2-in. Filter Frame  
 C – Extended Range with Mute Package with 2-in. Filter Frame  
 E – Standard Range with 2-in. Filter Frame  
 G – Standard Range with Mute Package with 2-in. Filter Frame  
 K – Extended Range with 1-in. Filter Frame  
 L – Extended Range with Mute Package with 2-in. Filter Rack  
 M – Extended Range with Mute Package with 1-in. Filter Frame  
 N – Standard Range with 2-in. Filter Rack  
 P – Standard Range with 1-in. Filter Frame  
 R – Standard Range with Mute Package with 2-in. Filter Rack  
 S – Standard Range with Mute Package with 1-in. Filter Frame

### Packaging

- 1 – Single Pack, Domestic

### Revision Code

- 0 – 006-012  
 1 – 018  
 2 – 024-070

### Voltage\*\*\*\*

- 1 – 575-3-60  
 3 – 208/230-1-60  
 4 – 265-1-60  
 5 – 208/230-3-60  
 6 – 460-3-60

### Heat Exchanger Options

- A – Copper with Coated Air Coil  
 C – Copper with Non-Coated Air Coil  
 D – Copper with Coated Air Coil with Reheat†  
 E – Copper with Non-Coated Air Coil with Reheat†  
 F – Cupronickel with Coated Air Coil with Reheat†  
 J – Cupronickel with Coated Air Coil  
 N – Cupronickel with Non-Coated Air Coil  
 P – Cupronickel with Non-Coated Air Coil with Reheat†  
 S – Cupronickel with Non-Coated Air Coil with Motorized Valve  
 T – Copper with Coated Air Coil with Motorized Valve  
 U – Copper with Coated Air Coil with Motorized Valve  
 W – Cupronickel with Coated Air Coil with Motorized Valve

### LEGEND

- DDC – Direct Digital Controls  
 ECM – Electronically Commutated Motor  
 EWT – Entering Water Temperature  
 HS – High Static  
 HWG – Hot Water Generator  
 HWR – Hot Water Reheat  
 LON – LONWorks Open System Protocol  
 PSC – Permanent Split Capacitor

\*Not available for sizes 006-012, PSC high static not available in size 070. ECM not available in 575-v units.

†Modulating HWR (hot water reheat) requires use of Deluxe D control.

\*\*BACview 6 handheld or USBLINK required for commissioning.

††460-v units utilizing ECM motor, internal secondary pump, and/or modulating reheat (pump) will require a neutral wire.



# AHRI/ISO capacity ratings



| 50PS<br>UNIT SIZE | FAN<br>MOTOR | WATER LOOP HEAT PUMP |      |                  |     | GROUND WATER HEAT PUMP |      |                  |     | GROUND LOOP HEAT PUMP |      |                  |     |
|-------------------|--------------|----------------------|------|------------------|-----|------------------------|------|------------------|-----|-----------------------|------|------------------|-----|
|                   |              | Cooling 86 F         |      | Heating 68 F     |     | Cooling 59 F           |      | Heating 50 F     |     | Cooling 77 F          |      | Heating 32 F     |     |
|                   |              | Capacity<br>Btuh     | EER  | Capacity<br>Btuh | COP | Capacity<br>Btuh       | EER  | Capacity<br>Btuh | COP | Capacity<br>Btuh      | EER  | Capacity<br>Btuh | COP |
| 006               | PSC          | 6,300                | 15.7 | 8,000            | 5.4 | 7,400                  | 25.5 | 6,300            | 4.4 | 6,700                 | 18.5 | 4,800            | 3.4 |
| 009               | PSC          | 9,300                | 15.3 | 11,100           | 4.8 | 11,100                 | 25.2 | 9,400            | 4.3 | 10,000                | 18.1 | 7,100            | 3.4 |
| 012               | PSC          | 11,700               | 15.4 | 13,800           | 4.5 | 13,300                 | 24.6 | 11,800           | 4.0 | 12,300                | 18.1 | 9,500            | 3.5 |
| 018               | PSC          | 18,600               | 15.0 | 23,000           | 5.2 | 21,300                 | 24.8 | 18,800           | 4.5 | 19,500                | 18.4 | 14,500           | 3.6 |
|                   | ECM          | 19,200               | 16.5 | 23,300           | 5.9 | 22,100                 | 26.3 | 18,900           | 4.9 | 20,200                | 19.4 | 14,500           | 3.9 |
| 024               | PSC          | 25,100               | 16.2 | 29,600           | 4.9 | 28,600                 | 25.7 | 25,000           | 4.3 | 26,300                | 19.1 | 19,000           | 3.7 |
|                   | ECM          | 25,000               | 17.0 | 30,000           | 5.3 | 28,100                 | 27.4 | 25,100           | 4.6 | 26,000                | 20.0 | 19,400           | 3.8 |
| 030               | PSC          | 28,200               | 15.3 | 34,900           | 5.0 | 31,700                 | 22.9 | 29,400           | 4.4 | 29,400                | 17.6 | 23,600           | 3.8 |
|                   | ECM          | 28,600               | 15.6 | 35,200           | 5.3 | 32,200                 | 23.9 | 29,400           | 4.6 | 29,800                | 18.0 | 23,700           | 3.9 |
| 036               | PSC          | 33,000               | 16.6 | 39,800           | 5.5 | 37,300                 | 25.1 | 32,900           | 4.8 | 34,500                | 19.2 | 25,700           | 3.9 |
|                   | ECM          | 33,100               | 17.6 | 39,500           | 5.8 | 37,300                 | 26.5 | 32,900           | 5.1 | 34,600                | 20.2 | 25,800           | 4.2 |
| 042               | PSC          | 37,400               | 16.0 | 49,400           | 5.4 | 42,900                 | 24.3 | 40,100           | 4.6 | 39,300                | 18.4 | 31,600           | 3.8 |
|                   | ECM          | 37,800               | 17.1 | 48,600           | 5.7 | 44,200                 | 27.1 | 39,300           | 4.9 | 40,000                | 20.0 | 30,400           | 4.0 |
| 048               | PSC          | 47,000               | 15.3 | 60,000           | 5.0 | 53,900                 | 23.3 | 49,000           | 4.4 | 49,900                | 17.6 | 39,000           | 3.7 |
|                   | ECM          | 47,600               | 15.9 | 59,700           | 5.2 | 54,100                 | 24.6 | 48,700           | 4.5 | 50,100                | 18.5 | 38,400           | 3.8 |
| 060               | PSC          | 61,000               | 15.9 | 70,400           | 5.0 | 67,000                 | 23.2 | 58,700           | 4.5 | 63,300                | 18.2 | 46,500           | 3.7 |
|                   | ECM          | 61,000               | 16.4 | 70,800           | 5.2 | 67,200                 | 24.3 | 59,100           | 4.6 | 64,000                | 19.0 | 46,700           | 3.8 |
| 070               | PSC          | 67,500               | 14.4 | 85,800           | 5.0 | 77,100                 | 21.6 | 69,400           | 4.3 | 70,800                | 16.6 | 54,000           | 3.6 |
|                   | ECM          | 67,000               | 15.2 | 84,900           | 5.0 | 77,000                 | 23.5 | 69,000           | 4.4 | 70,000                | 17.8 | 53,900           | 3.6 |

## LEGEND

**COP** — Coefficient of Performance  
**db** — Dry Bulb  
**EER** — Energy Efficiency Ratio  
**ECM** — Electronically Commutated Motor  
**PSC** — Permanent Split Capacitor  
**wb** — Wet Bulb

## NOTES:

1. Cooling capacities based upon 80.6 F db, 66.2 F wb entering air temperature.
2. Heating capacities based upon 68 F db, 59 F wb entering air temperature.
3. All ratings based upon operation at the lower voltage of dual voltage rated models.
4. Certified in accordance with the AHRI/ISO Standard 13256-1 Certification Program.



# Physical data



| 50PS UNIT SIZE                               | 006*            | 009*            | 012*            | 018             | 024             | 030             | 036                                 | 042                                 | 048                                 | 060                                 | 070                                |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------------------------|
| COMPRESSOR (1 Each)                          | Rotary          |                 |                 | Scroll          |                 |                 |                                     |                                     |                                     |                                     |                                    |
| FACTORY CHARGE R-410A (oz)                   | 24              | 32              | 34              | 50              | 56              | 58              | 70                                  | 80                                  | 80                                  | 136                                 | 144                                |
| ECM FAN MOTOR AND BLOWER                     |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| Fan Motor (Hp)                               | N/A             | N/A             | N/A             | 1/2             | 1/2             | 1/2             | 1/2                                 | 1/2                                 | 1                                   | 1                                   | 1                                  |
| Blower Wheel Size (D x W) (in.)              | N/A             | N/A             | N/A             | 9 x 7           | 9 x 7           | 9 x 7           | 11 x 10                             | 11 x 10                             | 11 x 10                             | 11 x 10                             | 11 x 10                            |
| PSC FAN MOTOR AND BLOWER                     |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| (3 Speeds)                                   |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| Fan Motor (Hp)                               | 1/25            | 1/20            | 1/8             | 1/6             | 1/5             | 1/3             | 1/2                                 | 1/2                                 | 3/4                                 | 1                                   | 1                                  |
| High Static Fan Motor (Hp)                   | N/A             | N/A             | N/A             | 1/5             | 1/3             | 1/2             | 1/2                                 | 3/4                                 | 3/4                                 | 1                                   | N/A                                |
| Blower Wheel Size (D x W) (in.)              | 6 x 5           | 6 x 5           | 6 x 5           | 9 x 7           | 9 x 7           | 9 x 7           | 10 x 10                             | 10 x 10                             | 10 x 10                             | 11 x 10                             | 11 x 10                            |
| Heat Exchanger Water Volume (gal.)           | 0.56            | 0.56            | 0.56            | 0.56            | 0.76            | 0.76            | 0.92                                | 1.24                                | 1.24                                | 1.56                                | 1.56                               |
| COAX VOLUME (gal.)                           | .17             | .29             | .45             | .56             | .76             | .76             | .92                                 | 1.24                                | 1.24                                | 1.56                                | 1.56                               |
| WATER CONNECTION SIZE, FPT (in.)             | 1/2             | 1/2             | 1/2             | 3/4             | 3/4             | 3/4             | 3/4                                 | 1                                   | 1                                   | 1                                   | 1                                  |
| HWG CONNECTION SIZE, FPT (in.)               | N/A             | N/A             | N/A             | 1/2             | 1/2             | 1/2             | 1/2                                 | 1/2                                 | 1/2                                 | 1/2                                 | 1/2                                |
| VERTICAL UPFLOW/DOWNFLOW                     |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| Air Coil Dimensions (H x W) (in.)            | 16 x 16         | 16 x 16         | 16 x 16         | 24 x 20         | 28 x 20         | 28 x 20         | 28 x 25                             | 32 x 25                             | 32 x 25                             | 36 x 25                             | 36 x 25                            |
| Throwaway Filter, Standard 1-in., Qty...Size | 1...<br>16 x 20 | 1...<br>16 x 20 | 1...<br>16 x 20 | 1...<br>24 x 24 | 1...<br>28 x 24 | 1...<br>28 x 24 | 1...<br>28 x 30                     | 2...<br>16 x 30                     | 2...<br>16 x 30                     | 1...<br>16 x 30;<br>1...<br>20 x 30 | 1...<br>16 x 30<br>1...<br>20 x 30 |
| Weight                                       |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| Operating (lb)                               | 126             | 146             | 150             | 252             | 266             | 268             | 327                                 | 414                                 | 416                                 | 441                                 | 443                                |
| Packaged (lb)                                | 136             | 156             | 160             | 262             | 276             | 278             | 337                                 | 424                                 | 426                                 | 451                                 | 453                                |
| HORIZONTAL                                   |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| Air Coil Dimensions (H x W) (in.)            | 16 x 16         | 16 x 16         | 16 x 16         | 18 x 27         | 18 x 31         | 18 x 31         | 20 x 35                             | 20 x 40                             | 20 x 40                             | 20 x 45                             | 20 x 45                            |
| Throwaway Filter, Standard 1-in., Qty...Size | 1...<br>16 x 20 | 1...<br>16 x 20 | 1...<br>16 x 20 | 2...<br>18 x 18 | 2...<br>18 x 18 | 2...<br>18 x 18 | 1...<br>12 x 20;<br>1...<br>20 x 25 | 1...<br>18 x 20;<br>1...<br>20 x 24 | 1...<br>18 x 20;<br>1...<br>20 x 24 | 2...<br>20 x 24                     | 2...<br>20 x 24                    |
| Weight                                       |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| Operating (lb)                               | 136             | 156             | 160             | 257             | 266             | 268             | 327                                 | 414                                 | 416                                 | 441                                 | 443                                |
| Packaged (lb)                                | 146             | 166             | 170             | 267             | 276             | 278             | 337                                 | 424                                 | 426                                 | 451                                 | 453                                |
| Corner (lb)                                  |                 |                 |                 |                 |                 |                 |                                     |                                     |                                     |                                     |                                    |
| Left Front                                   | 45.0            | 55.0            | 56.0            | 74.7            | 78.8            | 79.4            | 104.4                               | 144.3                               | 145.0                               | 182.3                               | 183.1                              |
| Left Rear                                    | 33.0            | 36.0            | 37.0            | 66.2            | 69.9            | 70.4            | 83.7                                | 97.7                                | 98.1                                | 78.4                                | 78.8                               |
| Right Front                                  | 30.0            | 33.0            | 34.0            | 63.6            | 67.2            | 67.7            | 74.9                                | 92.1                                | 92.6                                | 72.5                                | 72.8                               |
| Right Rear                                   | 28.0            | 32.0            | 33.0            | 47.5            | 50.2            | 50.5            | 64.0                                | 79.9                                | 80.3                                | 107.8                               | 108.3                              |

## LEGEND

**ECM** — Electronically Commutated Motor  
**FPT** — Female Pipe Thread  
**HWG** — Hot Water Generator  
**HWR** — Hot Water Reheat  
**PSC** — Permanent Split Capacitor  
**TXV** — Thermostatic Expansion Valve

\*Unit sizes 006-012 not available on 50PSD unit.

## NOTE:

All units have TXV (thermostatic expansion valve) expansion devices, and 1/2 and 3/4-in. electrical knockouts. 575-v motors are two-speed. For units with HWR option, add 66 lb to operating weights.

## UNIT MAXIMUM WATER WORKING PRESSURE

| OPTIONS                              | MAXIMUM PRESSURE (PSIG) |
|--------------------------------------|-------------------------|
| BaseUnit                             | 300                     |
| Internal Secondary Pump (ISP)        | 145                     |
| Hot Water Reheat (HWR)               | 145                     |
| Internal Motorized Water Valve (MWV) | 300                     |
| Internal Auto Flow Valve             | 300                     |

NOTE: Use lowest maximum pressure rating when multiple options are combined.

# Options and accessories



| ITEM   | FACTORY-<br>INSTALLED<br>OPTIONS | FIELD-<br>INSTALLED<br>ACCESSORIES |
|--|----------------------------------|------------------------------------|
| <b>Blower Motor</b>                                      |                                  |                                    |
| Permanent Split Capacitor, High Static                   | X                                |                                    |
| Electronically Commutated Motor                          | X                                |                                    |
| Cupronickel Heat Exchangers                              | X                                |                                    |
| Deluxe D Control System                                  | X                                |                                    |
| Disconnect   | X                                |                                    |
| Extended Range Units                                     | X                                |                                    |
| Hot Water Generator                                      | X                                |                                    |
| Internal Secondary Pump                                  | X                                |                                    |
| LONMark Compliant Controller                             | X                                |                                    |
| Modulating Hot Water Reheat (HWR)                        | X                                |                                    |
| PremierLink™ Intelligent Controller                      | X                                |                                    |
| Sound Attenuation (Mute) Package                         | X                                |                                    |
| Two-Way Motorized Control Valve                          | X                                | X                                  |
| Water Circuit Options                                    | X                                |                                    |
| WSHP Open Multiple Protocol Controller                   | X                                |                                    |
| Tin-Coated Airside Coil                                  | X                                |                                    |
| 2-in. Filter Rack  |                                  | X                                  |
| Aquazone™ System Control Panel                           |                                  | X                                  |
| Aquazone™ Thermostats                                    |                                  | X                                  |
| Auxiliary Heater (Duct Heater)                           |                                  | X                                  |
| Ball Valves (Brass Body)                                 |                                  | X                                  |
| Fire-Rated Hoses   |                                  | X                                  |
| Hose Kit Assemblies                                      |                                  | X                                  |
| Motorized Water Valves (Brass Body)                      |                                  | X                                  |
| Non-Programmable Thermostat                              |                                  | X                                  |
| PremierLink Accessories                                  |                                  | X                                  |
| Remote Sensors (SPT, CO <sub>2</sub> , Humidity Sensors) |                                  | X                                  |
| UC Open XP Loop Controller                               |                                  | X                                  |
| Y Strainers (Brass Body)                                 |                                  | X                                  |

## Factory-installed options

**Cupronickel heat exchangers** are available for higher corrosion protection for applications such as open tower, geothermal, etc. Consult the water quality guidelines for proper application and selection of this option.

**Sound attenuation package (mute package)** is available for applications that require especially low noise levels. With this option, a double application of sound attenuating material is applied, access panels are double dampened with 1/2-in. thick density fiberglass insulation, which is applied to the basepan, and a unique application of special dampening material is applied to the curved portion of the blower. The mute package in combination with standard unit noise reduction features (i.e., as mentioned previously) provides sound levels and noise reduction to the highest degree.

**Extended range units** have an insulated coaxial coil and insulated refrigerant and water piping to prevent condensation, and therefore potential dripping problems, in applications where the entering water temperature is below the normal operating range (less than 60 F). Units are capable of operating with an entering water temperature range of 20 to 120 F.

**Hot water generator** coil and 125 F high temperature switch to generate hot water using the unit. Hot water pumps are not provided with this option.

**Water circuit options** provide internally mounted 2.5 or 3.0 gpm per ton automatic flow regulating valves for easier installation.

**Modulating hot water reheat** diverts condenser water through a water-to-air coil that is placed after the evaporator coil. The modulating reheat valve automatically adjusts reheat capacity based upon leaving-air temperature and loop entering-water temperature to provide 100% reheat and neutral supply air to the space.

**Two-way motorized control valve** can be provided for applications involving open type systems or variable speed pumping. This valve will slowly open and close in conjunction with the compressor operation to shut off or turn on water to the unit.

**WSHP Open multiple protocol controller** is a proactive controller capable of communicating with BACnet, Modbus, N2, and LON (with a separate card) protocols. The controller is designed to allow users access and ability to change and configure multiple settings and features including indoor air quality (IAQ), waterside economizer controls, etc.

**Deluxe D control system** provides the same functions as the Complete C control system while incorporating additional flexibility and functions to include:

Thermostat input capabilities accommodate emergency shutdown mode and night setback with override potential. Night setback from low temperature thermostat with 2-hour override is initiated by a momentary signal from the thermostat.

Compressor relay staging is used with dual stage units (units with 2 compressors and 2 Deluxe D controls) or in master/slave applications.

Boilerless electric heat control system allows automatic changeover to electric heat at low loop water temperature.

Intelligent reversing valve operation minimizes reversing valve operation for extended life and quiet operation.

Thermostat type select (Y, O or Y, W) provides ability to work and select heat pump or heat/cool thermostats (Y, W).

Reversing valve signal select (O or B) provides selection for heat pump O/B thermostats.

The IdealHumidity™ system provides operation of fan control for dehumidification operation (units with ECM motor have input on the ECM board; optional Deluxe D board is not required).

Multiple units on one thermostat/wall sensor provides for communication for up to three heat pumps on one thermostat.

Boilerless changeover temperature provides selection of boilerless changeover temperature set point.

Accessory relays allow configuration for multiple applications including fan and compressor cycling, digital night setback (NSB), mechanical night setback, water valve operation, and outside air damper operation.

**PremierLink™ controller** is compatible with the Carrier Comfort Network® (CCN) and other building automation systems (BAS). This control is designed to allow users the access and ability to change factory-defined settings thus expanding the function of the standard unit.

**LONMark\* compliant controller** contains the factory-loaded Aquazone™ water source heat pump application for an interoperable control solution.

\* Registered trademark of Echelon Corporation.

# Options and accessories (cont)



**Permanent split capacitor (high static)** blower motors enable the 50PS units to increase performance levels in high-static applications.

**Electronically commutated motors (ECM)** provide soft starting, maintain constant airflow over the motor static operating range and provides airflow adjustment on the motor control board. The fan motor is isolated from the housing by rubber grommets, is permanently lubricated and has thermal overload protection.

## Field-installed accessories

**Aquazone™ system control panel** includes a preprogrammed, easy to use, Carrier Comfort Controller set up for a WSHP system.

- Panel coordinates and monitors loop water temperature and all water side ancillary equipment.
- The 50RLP model nomenclature is used to customize the control panel options to control all WSHP system requirements.
- Panel can be ordered to include 2, 4, 6, or 8 stages of system heat addition.
- Panel can be ordered with unique WSHP zone operation capabilities for stand-alone systems (i.e., noncommunicating) to control 10 or 18 zones of WSHP units.
- Panel can be ordered to control variable frequency cooling tower fan operation.
- System pumping operation can be configured for start/stop, lead/lag, or variable frequency pump operation.
- Direct Digital Controls (DDC) compatible using the Carrier Comfort Network® (CCN) and WSHP units utilizing PremierLink™ CCN controllers.

**Carrier's line of Aquazone thermostats** are both attractive and multi-functional, accommodating stand-alone water source heat pump installations.

Edge® Pro 7-day programmable thermostat offers 2-stage heat, 2-stage cool, remote contact input, remote sensor capability, pre-occupancy purge, soft start, manual/auto changeover, 4 settings per day, 24 vac, backlit LCD, keypad lockout, no batteries required, 5-minute compressor protection, never lost memory, 3 security levels, and temperature display in degrees F or C.

Comfort™ Pro 7-day programmable thermostat offers 2-stage heat, 2-stage cool, auto changeover, 4 settings per day, 24 vac, backlit LCD, keypad lockout, 5-minute compressor protection, never lost memory, 3 security levels, and temperature display in degrees F or C.

Comfort™ Pro 7-day non-programmable thermostat offers 2-stage heat, 2-stage cool, auto changeover, backlit display, keypad lockout, 5-minute compressor protection, dual set point with adjustable deadband, never lost memory, 3 security levels, and temperature display in degrees F or C.

**2 in. filter frame with door (enclosure)** is available in place of the standard 1-in. return air filter to enhance the filtration system of the water source heat pump. The 2-in. filter frame with filter access door does not include filters.

**Fire-rated hoses** are 2 ft long and have a fixed MPT on one end and a swivel with an adapter on the other end. Hose kits are provided with both a supply and return hose and can be either stainless steel or galvanized. Two sizes are available ( $\frac{3}{4}$  and 1 in.).

**Ball valves (brass body)** are used for shutoff and balancing water flow and are available with memory, memory stop, and pressure temperature ports. Ball valves consist of UL-listed brass body, ball and stem type with Teflon® seats and seals. Two sizes are available ( $\frac{3}{4}$  and 1 in.).

**Y strainers (bronze body)** are "Y" type strainers with a brass cap. With a maximum operating pressure rating of 450 psi, the strainer screen is made of stainless steel and is available with blow down valves. Two sizes are available ( $\frac{3}{4}$  and 1 in.).

**Motorized water control valves (brass body)** offer 3.5 watt coil, 24 volt, 50/60 Hz, 740 amps inrush, .312 amps holding. Motorized water valve is a slow-closing (ON/OFF) quiet operation with 24 vac, end switch and standard normally closed.

Two-way motorized control valve can be provided for applications involving open type systems or variable speed pumping. This valve will slowly open and close in conjunction with the compressor operation to shut off or turn on water to the unit.

**Auxiliary heaters (field-installed duct heater)** is used for electric heat in boilerless applications.

**Hose kit assemblies** provide all the necessary components to hook up a water-side system. Supply hose includes a ported ball valve with pressure temperature (P/T) plug ports, flexible stainless steel hose with swivel and nipple. Return hose includes a ball valve, preset automatic balancing valve (gpm) with two P/T ports, flexible stainless steel hose with a swivel and nipple, balancing valve, and low-pressure drop water control valve.

**Remote sensors** are available for Aquazone flush-mount thermostats and for wall (wired and wireless) or duct mounted applications.

SPT Standard offers space temperature sensor with communication port.

SPT Plus offers space temperature sensor with set point adjust, local override with indicating light and communication port.

SPT Pro offers space temperature sensor with LCD display, set point adjust, local override, alarm icon, outside air, and unit status with heating and cooling set points.

SPT Pro+ offers space temperature sensor with LCD display, set point adjust, local override, alarm icon, outside air, unit status with heating and cooling set points, and fan speed control.

LON wall sensors are available in 3 models: sensor only, sensor with status override indicator, and sensor with set point, status adjustment override, and digital LCD display.

**PremierLink™ accessories** are available for providing a fully integrated WSHP DDC system. Accessories include supply air temperature sensors (with override and/or set point adjustment), communicating room sensors, CO<sub>2</sub> sensors (for use in demand control ventilation), and linkage thermostats (to control multiple units from one thermostat).

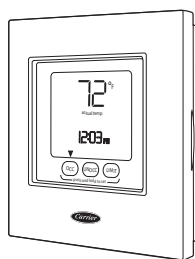
**UC Open XP loop controller** with six stages (2 stages for heating and 4 stages for cooling) includes:

- Loop temperature alarms
- Two pump single loop flow monitoring with the ability to manually select the lead pump
- One common alarm signal and indicating light and one audible alarm
- Loop water temperature sensor test circuit
- Functional test simulation from operator keypad
- Real timeclock, industrial noise ratings
- Loop water temperature control switch

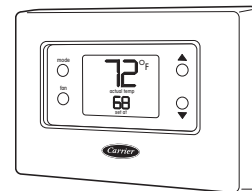
### AQUAZONE™ THERMOSTATS



**EDGE® PRO 7-DAY PROGRAMMABLE**

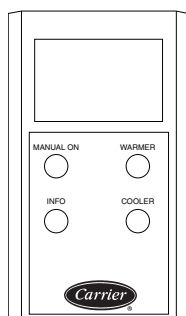


**COMFORT™ PRO 7-DAY PROGRAMMABLE**

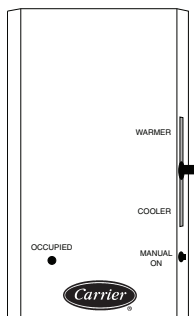


**COMFORT™ PRO 7-DAY NON-PROGRAMMABLE**

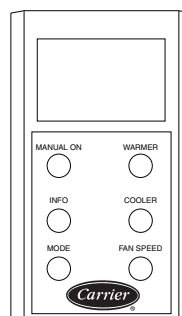
### WSHP OPEN SENSORS



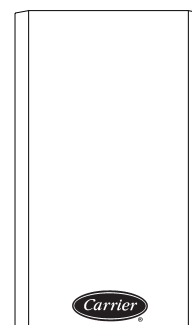
**SPACE TEMPERATURE SENSOR WITH SET POINT ADJUSTMENT AND LOCAL OVERRIDE**



**SPACE TEMPERATURE SENSOR WITH SLIDE SET POINT ADJUSTMENT AND LOCAL OVERRIDE**

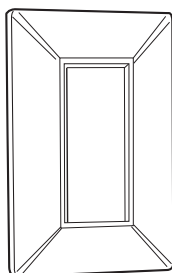


**SPACE TEMPERATURE SENSOR WITH SET POINT ADJUSTMENT, FAN SPEED CONTROL, AND LOCAL OVERRIDE**

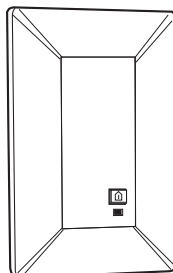


**SPACE TEMPERATURE SENSOR ONLY**

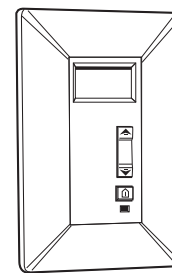
### LON WALL SENSORS



**SENSOR ONLY**



**SENSOR WITH OVERRIDE**



**SENSOR WITH SET POINT ADJUSTMENT, OVERRIDE AND DIGITAL LCD**

## 50PS HORIZONTAL UNITS (50PSH006-070)

| 50PSH<br>UNIT<br>SIZE | OVERALL<br>CABINET<br>(in.) |            |             | WATER CONNECTIONS<br>(in.) |          |                |                 |                      |                      |            | WATER<br>CONNECTIONS<br>(in.) - UNITS WITH<br>HWR |               | ELECTRICAL<br>KNOCKOUTS<br>(in.) |                  |                  |
|-----------------------|-----------------------------|------------|-------------|----------------------------|----------|----------------|-----------------|----------------------|----------------------|------------|---|---------------|----------------------------------|------------------|------------------|
|                       |                             |            |             | 1                          | 2        | 3              | 4               | 5                    | Loop<br>Water<br>FPT | HWG<br>FPT | 1   | 2             | J<br>1/2<br>Cond                 | K<br>1/2<br>Cond | L<br>3/4<br>Cond |
|                       | A<br>Width                  | B<br>Depth | C<br>Height | D<br>In                    | E<br>Out | F<br>HWG<br>In | G<br>HWG<br>Out | H<br>Con-<br>densate |                      |            | Loop In<br>D                                      | Loop Out<br>E | Low<br>Voltage                   | Ext<br>Pump      | Power<br>Supply  |
| 006,009,012           | 22.4                        | 43.1       | 17.3        | 3.7                        | 9.7      | N/A            | N/A             | 0.8                  | 1/2                  | N/A        | N/A   | N/A           | 3.8                              | 6.3              | 8.8              |
| 018                   | 22.4                        | 62.2       | 19.3        | 2.1                        | 10.0     | 13.9           | 16.9            | 0.6                  | 3/4                  | 1/2        | 2.10  | 10.00         | 3.6                              | 6.1              | 8.6              |
| 024,030               | 22.4                        | 62.2       | 19.3        | 2.1                        | 10.0     | 13.9           | 16.9            | 0.6                  | 3/4                  | 1/2        | 5.96  | 13.13         | 3.6                              | 6.1              | 8.6              |
| 036                   | 25.4                        | 71.2       | 21.3        | 3.4                        | 10.8     | 15.6           | 18.9            | 0.6                  | 3/4                  | 1/2        | 5.96  | 13.13         | 3.6                              | 6.1              | 8.6              |
| 042,048               | 25.4                        | 76.2       | 21.3        | 3.4                        | 10.8     | 15.6           | 18.9            | 0.6                  | 1                    | 1/2        | 5.96  | 13.13         | 3.6                              | 6.1              | 8.6              |
| 060,070               | 25.4                        | 81.2       | 21.3        | 3.4                        | 10.8     | 15.6           | 18.9            | 0.6                  | 1                    | 1/2        | 5.96  | 13.13         | 3.6                              | 6.1              | 8.6              |

| 50PSH<br>UNIT<br>SIZE | DISCHARGE CONNECTION (in.)<br>DUCT FLANGE INSTALLED<br>(±0.10 in.) |     |                       |                      |                  |     | RETURN<br>CONNECTION (in.)<br>USING RETURN<br>AIR OPENING<br>(±0.10 in.) |                       |     |     | RETURN<br>CONNECTION (in.)<br>USING OPTIONAL AIR FILTER<br>FRAME<br>(±0.10 in.) |                       |     |     |
|-----------------------|--|-----|-----------------------|----------------------|------------------|-----|--|-----------------------|-----|-----|---|-----------------------|-----|-----|
|                       | M<br>(LH return)   | N   | O<br>Supply<br>Height | P<br>Supply<br>Width | Q<br>(RH return) | R   | S<br>Return<br>Depth   | T<br>Return<br>Height | U   | V   | S<br>Return<br>Depth  | T<br>Return<br>Height | U   | V   |
| 006,009,012           | 5.3  | 4.1 | 9.0                   | 9.0                  | 5.3              | 4.1 | 17.1   | 15.3                  | 2.1 | 1.0 | 17.7  | 14.2                  | 2.3 | 1.7 |
| 018                   | 3.6  | 2.0 | 15.5                  | 12.5                 | 3.6              | 2.0 | 28.1   | 17.3                  | 6.2 | 1.0 | 33.8  | 16.2                  | 2.3 | 1.7 |
| 024,030               | 3.6  | 2.0 | 15.5                  | 12.5                 | 3.6              | 2.0 | 32.1   | 17.3                  | 2.3 | 1.0 | 33.8  | 16.2                  | 2.3 | 1.7 |
| 036                   | 3.1  | 1.2 | 19.0                  | 17.5                 | 3.1              | 1.0 | 36.1   | 19.3                  | 2.3 | 1.0 | 34.8  | 18.2                  | 3.1 | 1.7 |
| 042,048               | 3.1  | 1.2 | 19.0                  | 17.5                 | 3.1              | 1.0 | 41.1   | 19.3                  | 2.3 | 1.0 | 39.8  | 18.2                  | 3.1 | 1.7 |
| 060,070               | 3.1  | 1.2 | 19.0                  | 17.5                 | 3.1              | 1.0 | 46.1   | 19.3                  | 2.3 | 1.0 | 44.8  | 18.2                  | 3.1 | 1.7 |

| 50PSH UNIT SIZE | CORNER WEIGHTS (lb) |             |              |           |            |
|-----------------|---------------------|-------------|--------------|-----------|------------|
|                 | Total               | Left-Front* | Right-Front* | Left-Back | Right-Back |
| 006             | 136                 | 45.0        | 30.0         | 33.0      | 28.0       |
| 009             | 156                 | 55.0        | 33.0         | 36.0      | 32.0       |
| 012             | 160                 | 56.0        | 34.0         | 37.0      | 33.0       |
| 018             | 257                 | 78.1        | 64.6         | 66.2      | 47.5       |
| 024             | 266                 | 78.8        | 67.2         | 69.9      | 50.2       |
| 030             | 268                 | 79.4        | 67.7         | 70.4      | 50.5       |
| 036             | 327                 | 104.4       | 74.9         | 83.7      | 64.0       |
| 042             | 414                 | 144.3       | 92.1         | 97.7      | 79.9       |
| 048             | 416                 | 145.0       | 92.6         | 98.1      | 80.3       |
| 060             | 441                 | 182.3       | 72.5         | 78.4      | 107.8      |
| 070             | 443                 | 183.1       | 72.8         | 78.8      | 108.3      |

\*Front is control box end.

### NOTES:

1. Condensate is 3/4-in. FPT copper.
2. Horizontal unit shipped with filter bracket only. This bracket should be removed for return duct connection.
3. Discharge flange and hanger kit is factory installed.
4. Shaded areas are recommended service areas, not required.
5. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.

### LEGEND

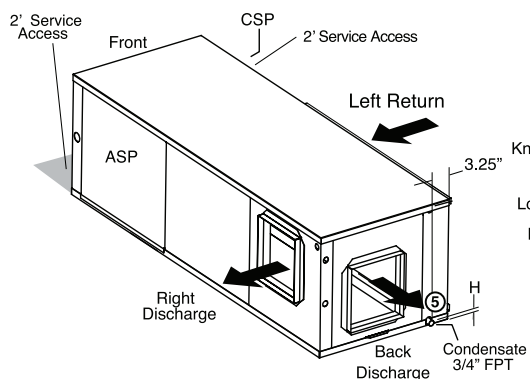
|     |                            |
|-----|----------------------------|
| ASP | — Alternate Service Panel  |
| BSP | — Blower Service Panel     |
| CAP | — Control Access Panel     |
| CSP | — Compressor Service Panel |
| FPT | — Female Pipe Thread       |
| HWG | — Hot Water Generator      |
| HWR | — Hot Water Reheat         |
| LH  | — Left Hand                |
| RH  | — Right Hand               |

### PSC BLOWER AIRFLOW CONFIGURATION

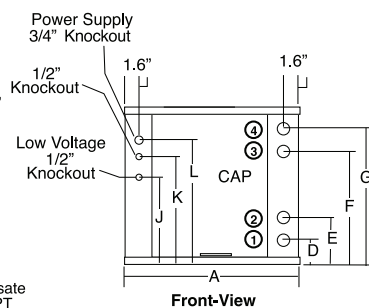
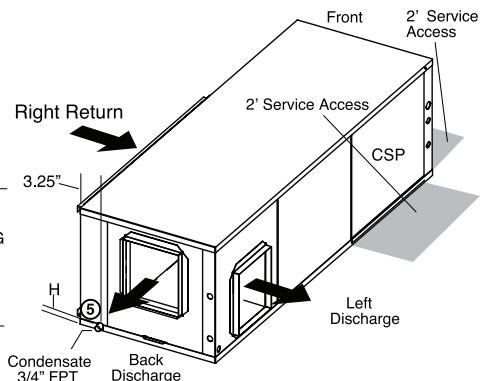
| CODE | RETURN | DISCHARGE |
|------|--------|-----------|
| E    | Left   | Back      |
| B    | Right  | Back      |
| S    | Left   | Right     |
| Z    | Right  | Left      |

## 50PS HORIZONTAL UNITS (50PSH006-070) (cont)

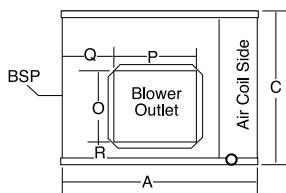
### LEFT RETURN



### RIGHT RETURN

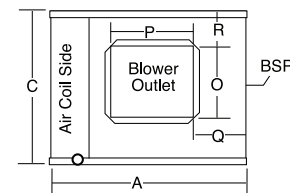


### Unit Hanger Detail

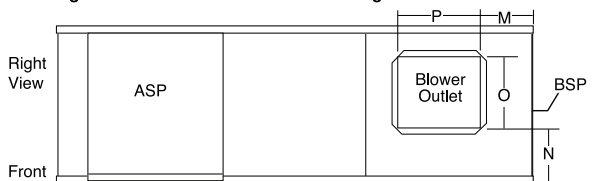


Configuration E - Left Return / Back Discharge

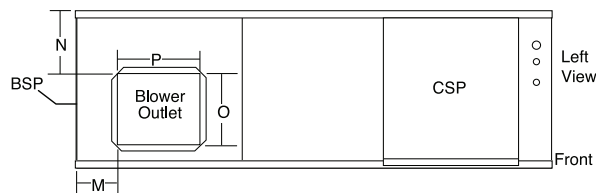
| Model   | X<br>in. | Y<br>in. | Z<br>in. |
|---------|----------|----------|----------|
| 006-012 | 43.1     | 24.5     | 20.3     |
| 018-030 | 62.1     | 24.5     | 20.3     |
| 036     | 71.1     | 27.5     | 23.3     |
| 042-048 | 76.1     | 27.5     | 23.3     |
| 060-070 | 81.1     | 27.5     | 23.3     |



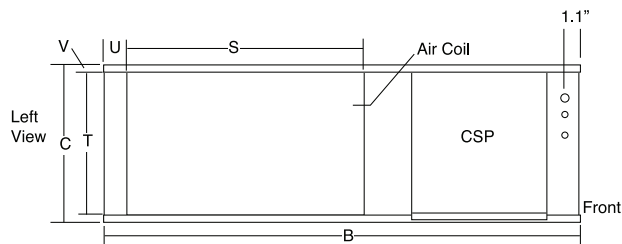
Configuration B - Right Return / Back Discharge



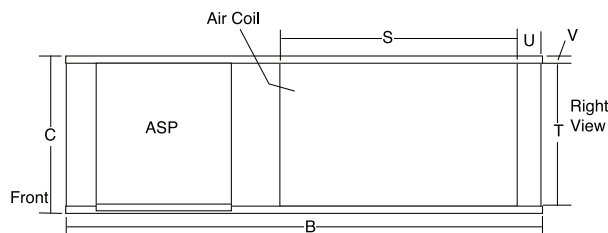
Configuration S - Left Return / Right Discharge - Air Coil Opening



Configuration Z - Right Return / Left Discharge - Air Coil Opening



Configuration S - Left Return / Right Discharge - Air Coil Opening



Configuration Z - Right Return / Left Discharge - Air Coil Opening

NOTE: Right or left discharge can be field-converted to back discharge and visa versa. See Installation Instructions for additional details.

# Dimensions (cont)

## 50PS VERTICAL UPFLOW UNITS (50PSV006-070)

| 50PSV<br>UNIT<br>SIZE | OVERALL<br>CABINET<br>(in.) |            |             | WATER CONNECTIONS<br>(in.) |          |                |                 |                      |                      |            |              | WATER<br>CONNECTIONS (in.)<br>- UNITS<br>WITH<br>HWR |                 | ELECTRICAL<br>KNOCKOUTS<br>(in.) |                 |                   | DISCHARGE CONNECTION<br>(in.)<br>DUCT FLANGE INSTALLED<br>(±0.10 in.) |                      |                      |                   |  |
|-----------------------|-----------------------------|------------|-------------|----------------------------|----------|----------------|-----------------|----------------------|----------------------|------------|--------------|--|-----------------|----------------------------------|-----------------|-------------------|---|----------------------|----------------------|-------------------|--|
|                       |                             |            |             | 1                          | 2        | 3              | 4               | 5                    | Loop<br>Water<br>FPT | HWG<br>FPT | 1            | 2  | J<br>1½<br>Cond | K<br>1½<br>Cond                  | L<br>¾<br>Cond  | M<br>(LH<br>rtrn) | N   | O<br>Supply<br>Width | P<br>Supply<br>Depth | Q<br>(RH<br>rtrn) |  |
|                       | A<br>Width                  | B<br>Depth | C<br>Height | D<br>In                    | E<br>Out | F<br>HWG<br>In | G<br>HWG<br>Out | H<br>Conden-<br>sate |                      |            | Loop<br>In D | Loop<br>Out<br>E                                     | Low<br>Voltage  | Ext<br>Pump                      | Power<br>Supply |                   |   |                      |                      |                   |  |
|                       |                             |            |             |                            |          |                |                 |                      |                      |            |              |  |                 |                                  |                 |                   |   |                      |                      |                   |  |
| 006,009,012           | 22.4                        | 21.6       | 34.5        | 3.7                        | 9.7      | N/A            | N/A             | 7.4                  | 1½                   | N/A        | N/A          | N/A  | 3.8             | 6.3                              | 8.8             | 6.7               | 6.3   | 9.0                  | 9.0                  | 6.7               |  |
| 018                   | 22.4                        | 25.6       | 44.6        | 2.1                        | 10.0     | 13.9           | 16.9            | 7.8                  | ¾                    | 1½         | 2.1          | 10.0   | 3.6             | 6.1                              | 8.6             | 7.2               | 5.8   | 14.0                 | 14.0                 | 4.9               |  |
| 024,030               | 22.4                        | 25.6       | 48.5        | 2.1                        | 10.0     | 13.9           | 16.9            | 7.8                  | ¾                    | 1½         | 5.26         | 13.13  | 3.6             | 6.1                              | 8.6             | 7.2               | 5.8   | 14.0                 | 14.0                 | 4.9               |  |
| 036                   | 25.4                        | 30.6       | 50.5        | 3.4                        | 10.8     | 15.6           | 18.9            | 7.8                  | ¾                    | 1½         | 5.96         | 13.13  | 3.6             | 6.1                              | 8.6             | 6.4               | 6.3   | 18.0                 | 18.0                 | 5.3               |  |
| 042,048               | 25.4                        | 30.6       | 54.5        | 3.4                        | 10.8     | 15.6           | 18.9            | 7.8                  | 1                    | 1½         | 5.96         | 13.13  | 3.6             | 6.1                              | 8.6             | 6.4               | 6.3   | 18.0                 | 18.0                 | 5.3               |  |
| 060,070               | 25.4                        | 30.6       | 58.5        | 3.4                        | 10.8     | 15.6           | 18.9            | 7.8                  | 1                    | 1½         | 5.96         | 13.13  | 3.6             | 6.1                              | 8.6             | 6.4               | 6.3   | 18.0                 | 18.0                 | 5.3               |  |

| 50PSV<br>UNIT<br>SIZE | RETURN<br>CONNECTION (in.)<br>USING RETURN<br>AIR OPENING<br>(±0.10 in.) |                      |                       |     | RETURN<br>CONNECTION (in.)<br>USING AIR FILTER<br>FRAME<br>(±0.10 in.) |                      |                       |     |
|-----------------------|--|----------------------|-----------------------|-----|--|----------------------|-----------------------|-----|
|                       | R  | S<br>Return<br>Depth | T<br>Return<br>Height | U   | R  | S<br>Return<br>Depth | T<br>Return<br>Height | U   |
|                       |  |                      |                       |     |  |                      |                       |     |
| 006,009,012           | 2.3  | 17.1                 | 15.3                  | 1.0 | 1.7  | 17.7                 | 14.2                  | 1.7 |
| 018                   | 2.3  | 21.1                 | 23.7                  | 1.0 | 1.7  | 22.2                 | 22.2                  | 1.7 |
| 024,030               | 2.3  | 21.1                 | 27.7                  | 1.0 | 1.7  | 22.2                 | 26.2                  | 1.7 |
| 036                   | 2.3  | 26.1                 | 27.7                  | 1.0 | 1.7  | 27.2                 | 26.2                  | 1.7 |
| 042,048               | 2.3  | 26.1                 | 31.7                  | 1.0 | 1.7  | 27.2                 | 30.2                  | 1.7 |
| 060,070               | 2.3  | 26.1                 | 35.7                  | 1.0 | 1.7  | 27.2                 | 34.2                  | 1.7 |

**LEGEND**

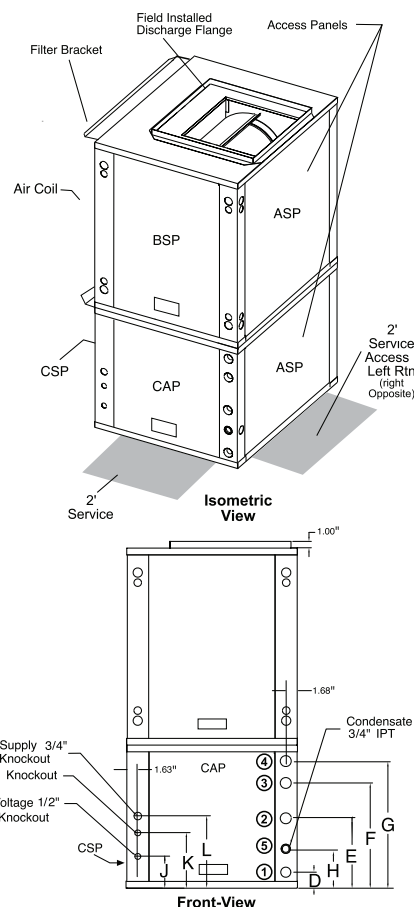
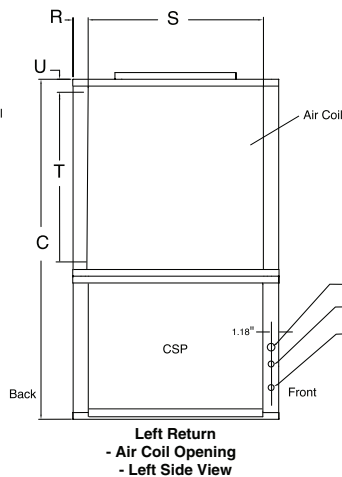
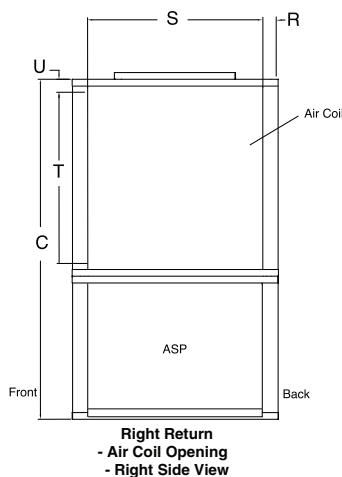
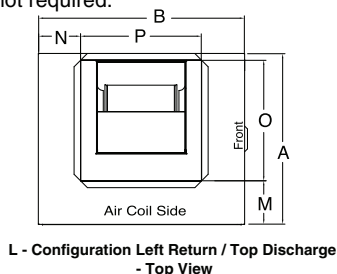
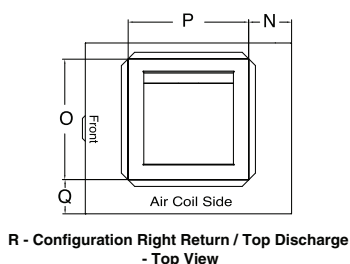
ASP — Alternate Service Panel  
BSP — Blower Service Panel  
CAP — Control Access Panel  
CSP — Compressor Service Panel  
FPT — Female Pipe Thread  
HWG — Hot Water Generator  
HWR — Hot Water Reheat  
LH — Left Hand  
RH — Right Hand

### PSC BLOWER AIRFLOW CONFIGURATION

| CODE | RETURN | DISCHARGE |
|------|--------|-----------|
| L    | Left   | Top       |
| R    | Right  | Top       |

### NOTES:

1. Condensate is 3/4-in. FPT copper and is switchable from side to front.
2. Vertical unit shipped with filter bracket only, extending from unit 2.5-in. This bracket should be removed for return duct connection.
3. Discharge flange field installed.
4. Shaded areas are recommended service areas, not required.



### 50PS VERTICAL DOWNFLOW UNITS (50PSD018-070)

| 50PSD<br>UNIT<br>SIZE | OVERALL<br>CABINET<br>(in.) |            |             | WATER CONNECTIONS<br>(in.) |          |                |                 |                      |                      |            | WATER<br>CONNECTIONS (in.)<br>- UNITS<br>WITH<br>HWR |                  | ELECTRICAL<br>KNOCKOUTS<br>(in.) |                 |                 | DISCHARGE CONNECTION<br>(in.)<br>DUCT FLANGE INSTALLED<br>(±0.10 in.) |     |                      |                      |                   |
|-----------------------|-----------------------------|------------|-------------|----------------------------|----------|----------------|-----------------|----------------------|----------------------|------------|--|------------------|----------------------------------|-----------------|-----------------|---|-----|----------------------|----------------------|-------------------|
|                       |                             |            |             | 1                          | 2        | 3              | 4               | 5                    | Loop<br>Water<br>FPT | HWG<br>FPT | 1  | 2                | J<br>1½<br>Cond                  | K<br>1½<br>Cond | L<br>¾<br>Cond  | M<br>(LH<br>rtrn)   | N   | O<br>Supply<br>Width | P<br>Supply<br>Depth | Q<br>(RH<br>rtrn) |
|                       | A<br>Width                  | B<br>Depth | C<br>Height | D<br>In                    | E<br>Out | F<br>HWG<br>In | G<br>HWG<br>Out | H<br>Conden-<br>sate |                      |            | Loop<br>In D   | Loop<br>Out<br>E | Low<br>Voltage                   | Ext<br>Pump     | Power<br>Supply |   |     |                      |                      |                   |
|                       | 018                         | 22.4       | 25.6        | 48.4                       | 17.2     | 9.3            | 5.4             | 2.4                  | 3.6                  | ¾          | ½  | 2.1              | 10.0                             | 3.6             | 6.1             | 8.6   | 6.7 | 8.4                  | 10.1                 | 9.1               |
| 024,030               | 22.4                        | 25.6       | 52.5        | 17.9                       | 10.5     | 5.7            | 2.4             | 3.6                  | ¾                    | ½          | 5.96   | 13.13            | 3.6                              | 6.1             | 8.6             | 6.7   | 8.4 | 10.1                 | 9.1                  | 10.8              |
| 036                   | 25.4                        | 30.6       | 54.5        | 17.9                       | 10.5     | 5.7            | 2.4             | 3.6                  | ¾                    | ½          | 5.96   | 13.13            | 3.6                              | 6.1             | 8.6             | 7.2   | 9.0 | 13.4                 | 12.9                 | 10.4              |
| 042,048               | 25.4                        | 30.6       | 58.5        | 17.9                       | 10.5     | 5.7            | 2.4             | 3.6                  | 1                    | ½          | 5.96   | 13.13            | 3.6                              | 6.1             | 8.6             | 7.2   | 9.0 | 13.4                 | 12.9                 | 10.4              |
| 060,070               | 25.4                        | 30.6       | 62.5        | 17.9                       | 10.5     | 5.7            | 2.4             | 3.6                  | 1                    | ½          | 5.96   | 13.13            | 3.6                              | 6.1             | 8.6             | 7.2   | 9.0 | 13.4                 | 12.9                 | 10.4              |

| 50PSD<br>UNIT<br>SIZE | RETURN<br>CONNECTION (in.)<br>USING RETURN<br>AIR OPENING<br>(±0.10 in.) |                      |                       |      | RETURN<br>CONNECTION (in.)<br>USING RETURN<br>AIR OPENING<br>(±0.10 in.) |                      |                       |      |
|-----------------------|--|----------------------|-----------------------|------|--|----------------------|-----------------------|------|
|                       | R  | S<br>Return<br>Depth | T<br>Return<br>Height | U    | R  | S<br>Return<br>Depth | T<br>Return<br>Height | U    |
| 018                   | 2.2  | 21.1                 | 23.7                  | 21.2 | 1.7  | 22.2                 | 22.2                  | 21.9 |
| 024,030               | 2.2  | 21.1                 | 27.7                  | 21.2 | 1.7  | 22.2                 | 26.2                  | 21.9 |
| 036                   | 2.2  | 26.1                 | 27.7                  | 23.2 | 1.7  | 27.2                 | 26.2                  | 23.9 |
| 042,048               | 2.2  | 26.1                 | 31.7                  | 23.2 | 1.7  | 27.2                 | 30.2                  | 23.9 |
| 060,070               | 2.2  | 26.1                 | 35.7                  | 23.2 | 1.7  | 27.2                 | 34.2                  | 23.9 |

**LEGEND**

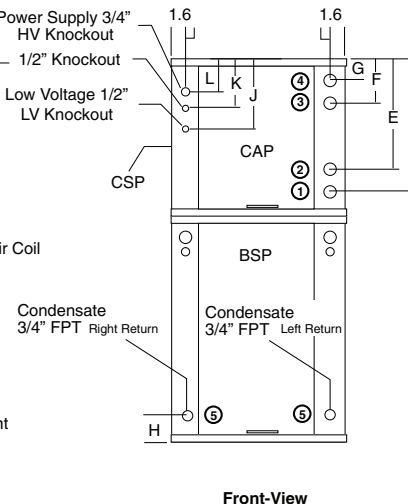
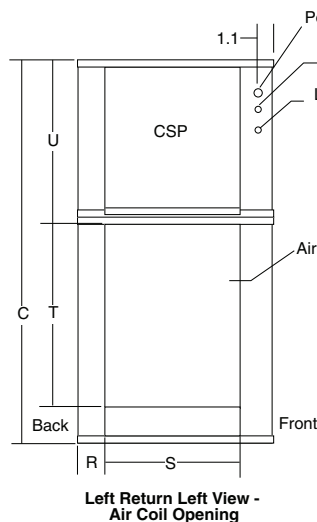
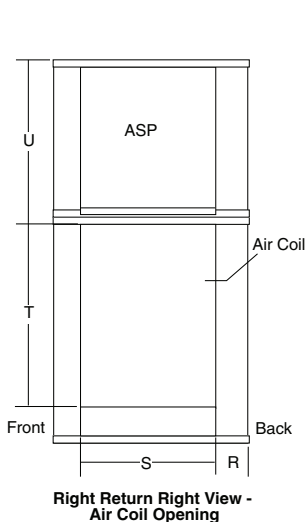
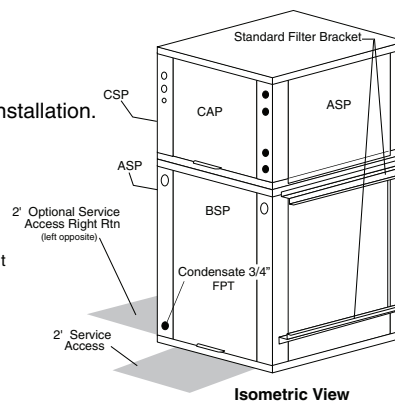
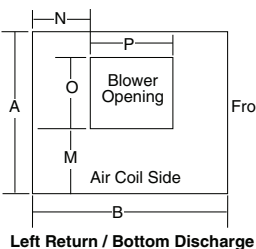
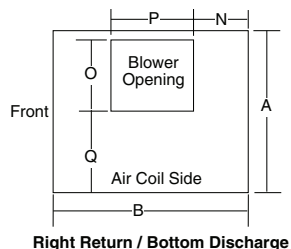
ASP — Alternate Service Panel  
BSP — Blower Service Panel  
CAP — Control Access Panel  
CSP — Compressor Service Panel  
FPT — Female Pipe Thread  
HWG — Hot Water Generator  
HWR — Hot Water Reheat  
LH — Left Hand  
RH — Right Hand

#### PSC BLOWER AIRFLOW CONFIGURATION

| CODE | RETURN | DISCHARGE |
|------|--------|-----------|
| L    | Left   | Bottom    |
| R    | Right  | Bottom    |

#### NOTES:

1. Condensate is 3/4-in. FPT copper and is switchable from side to front.
2. Vertical unit shipped with filter bracket only, extending from unit 2.5-in. This bracket should be removed for return duct connection.
3. Downflow unit does not have discharge flange, and is rated for zero clearance installation.
4. Shaded areas are recommended service areas, not required.



# Selection procedure (50PSH024 unit example)



## I Determine the actual cooling and heating loads at the desired dry bulb and wet bulb conditions.

Given:

Total Cooling (TC) ..... 24,000 Btuh  
Sensible Cooling (SC) ..... 17,900 Btuh  
Entering-Air Temperature db ..... 80.6 F  
Entering-Air Temperature wb ..... 65 F

## II Determine the following design parameters from Performance Data tables.

Determine entering water temperature, water flow rate (gpm), airflow (cfm), water flow pressure drop and design wet and dry bulb temperatures. Airflow cfm should be between 300 and 450 cfm per ton. Unit water pressure drop should be kept as close as possible to each other to make water balancing easier. For the 50PSH024 unit example, the given design parameters are as follows:

Given:

Entering Water Temperature ..... 90 F  
Water Flow (Based upon  
12 F rise in temperature) ..... 6.0 gpm  
Airflow ..... 748 cfm

## III Select a unit based on total cooling and total sensible cooling conditions. Unit selected should be closest to but not larger than the actual cooling load.

Enter Performance Data tables at the design water flow and water temperature. Read the total and sensible cooling capacities.

NOTE: Interpolation is permissible, extrapolation is not.

For example:

Enter the 50PSH024 (PSC Blower) Performance Table at design water flow and water temperature. Read Total Cooling, Sensible Cooling and Heat of Rejection capacities:

Total Cooling ..... 25,200 Btuh  
Sensible Cooling ..... 18,400 Btuh  
Heat of Rejection ..... 31,100 Btuh

Read the Heat Capacity. If the Heat Capacity exceeds the design criteria specified in the scope, it is acceptable.

NOTE: It is normal for water source heat pumps to be selected on cooling capacity only since the heating output is usually greater than the cooling capacity.

## IV Determine the correction factors associated with the variable factors of dry bulb and wet bulb using the correction factor tables found in this book.

Use the following formulas to determine the correction factors of total cooling, sensible cooling, and heat of rejection:

- Corrected Total Cooling = tabulated total cooling x wet bulb correction x airflow correction.

- Corrected Sensible Cooling = tabulated sensible cooling x wet/dry bulb correction x airflow correction.
- Corrected Heat of Rejection = tabulated heat of rejection x wet bulb correction x airflow correction.

## V Determine entering air and airflow correction using the correction factor tables found in this book.

The nominal airflow for the 50PSH024 is 850 cfm. The design parameter is 748 cfm.

$748/850 = 87.5\%$  of nominal airflow:

Use the 87.5% row in the Airflow Correction Table (PSC Airflow).

The Entering-Air Temperature is 65 F wb. Use the 65 F row in the Entering Air Correction Table.

Using the following formulas to determine the correction factors of entering air and airflow correction:

|                             | Table | Ent Air        | Airflow | Corrected |
|-----------------------------|-------|----------------|---------|-----------|
| Corrected Total Cooling     | =     | 25,200 x 0.971 | x 0.983 | = 24,053  |
| Corrected Sensible Cooling  | =     | 18,400 x 1.106 | x 0.915 | = 18,520  |
| Corrected Heat of Rejection | =     | 31,100 x 0.976 | x 0.983 | = 29,838  |

Compare the corrected capacities to the load requirements established in Step I. If the capacities are within 10% of the load requirements, the equipment is acceptable. It is better to undersize than oversize as undersizing improves humidity control, reduces sound levels and extends the life of the equipment.

## VI Calculate and assess the water temperature rise.

Calculate the water temperature rise and assess the selection using the following calculation:

$$\text{Actual Temperature Rise} = \frac{\text{Corrected Heat of Rejection}}{\text{GPM} \times 500}$$

For example, using the Corrected Heat of Rejection from the last step:

$$\text{Actual Temperature Rise} = \frac{29,838}{6.0 \times 500} = 9.9 \text{ F}$$

If the units selected are not within 10% of the load calculations, review what effect changing the GPM, water temperature and/or airflow will have on the corrected capacities. If the desired capacity cannot be achieved, select the next larger or smaller unit and repeat Steps I through VI.

# Performance data



## 50PSH,PSV006

### 240 CFM NOMINAL AIRFLOW COOLING/240 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM | PRESSURE DROP |       | COOLING                   |     |     |                   |      |     |      | HEATING                   |     |      |     |       |     |
|------------|-----|---------------|-------|---------------------------|-----|-----|-------------------|------|-----|------|---------------------------|-----|------|-----|-------|-----|
|            |     | PSI           | ft wg | Airflow<br>CFM            | TC  | TSC | Sens/Tot<br>Ratio | kW   | THR | EER  | Airflow<br>CFM            | THC | kW   | HE  | LAT   | COP |
| 20         | 2.0 | 3.2           | 7.4   | Operation Not Recommended |     |     |                   |      |     |      | 180                       | 3.8 | 0.48 | 2.3 | 89.6  | 2.3 |
|            | 2.0 | 3.2           | 7.4   |                           |     |     |                   |      |     |      | 240                       | 3.9 | 0.44 | 2.4 | 85.1  | 2.6 |
| 30         | 1.0 | 0.3           | 0.7   | 180                       | 6.7 | 3.9 | 0.6               | 0.26 | 7.6 | 25.6 | 180                       | 4.6 | 0.50 | 3.0 | 93.4  | 2.7 |
|            | 1.0 | 0.3           | 0.7   | 240                       | 7.0 | 4.7 | 0.7               | 0.27 | 7.9 | 25.8 | 240                       | 4.7 | 0.45 | 3.1 | 88.0  | 3.0 |
|            | 1.5 | 1.6           | 3.7   | 180                       | 6.9 | 3.9 | 0.6               | 0.26 | 7.8 | 26.9 | 180                       | 4.8 | 0.50 | 3.2 | 94.5  | 2.8 |
|            | 1.5 | 1.6           | 3.7   | 240                       | 7.2 | 4.7 | 0.7               | 0.26 | 8.1 | 27.1 | 240                       | 4.9 | 0.46 | 3.3 | 88.9  | 3.1 |
|            | 2.0 | 3.0           | 6.9   | 180                       | 7.0 | 4.0 | 0.6               | 0.25 | 7.9 | 27.7 | 180                       | 4.9 | 0.50 | 3.3 | 95.0  | 2.8 |
|            | 2.0 | 3.0           | 6.9   | 240                       | 7.3 | 4.8 | 0.7               | 0.26 | 8.2 | 27.9 | 240                       | 5.0 | 0.46 | 3.5 | 89.3  | 3.2 |
| 40         | 1.0 | 0.3           | 0.7   | 180                       | 7.0 | 4.2 | 0.6               | 0.28 | 7.9 | 24.8 | 180                       | 5.4 | 0.51 | 3.7 | 97.8  | 3.1 |
|            | 1.0 | 0.3           | 0.7   | 240                       | 7.3 | 5.0 | 0.7               | 0.29 | 8.2 | 25.0 | 240                       | 5.6 | 0.47 | 4.0 | 91.4  | 3.5 |
|            | 1.5 | 1.4           | 3.2   | 180                       | 7.0 | 4.2 | 0.6               | 0.27 | 8.0 | 25.9 | 180                       | 5.6 | 0.51 | 3.9 | 98.9  | 3.2 |
|            | 1.5 | 1.4           | 3.2   | 240                       | 7.3 | 5.0 | 0.7               | 0.28 | 8.3 | 26.1 | 240                       | 5.8 | 0.47 | 4.2 | 92.3  | 3.6 |
|            | 2.0 | 2.6           | 6.5   | 180                       | 7.1 | 4.2 | 0.6               | 0.27 | 8.0 | 26.7 | 180                       | 5.7 | 0.51 | 4.1 | 99.5  | 3.3 |
|            | 2.0 | 2.6           | 6.5   | 240                       | 7.4 | 5.0 | 0.7               | 0.27 | 8.3 | 26.9 | 240                       | 5.9 | 0.47 | 4.3 | 92.7  | 3.7 |
| 50         | 1.0 | 0.3           | 0.7   | 180                       | 6.9 | 4.4 | 0.6               | 0.31 | 8.0 | 22.2 | 180                       | 6.1 | 0.52 | 4.4 | 101.6 | 3.5 |
|            | 1.0 | 0.3           | 0.7   | 240                       | 7.2 | 5.2 | 0.7               | 0.32 | 8.3 | 22.4 | 240                       | 6.3 | 0.48 | 4.7 | 94.3  | 3.9 |
|            | 1.5 | 1.4           | 3.2   | 180                       | 7.0 | 4.4 | 0.6               | 0.29 | 8.0 | 23.9 | 180                       | 6.4 | 0.52 | 4.6 | 102.7 | 3.6 |
|            | 1.5 | 1.4           | 3.2   | 240                       | 7.3 | 5.2 | 0.7               | 0.30 | 8.4 | 24.0 | 240                       | 6.5 | 0.48 | 4.9 | 95.2  | 4.0 |
|            | 2.0 | 2.6           | 6.0   | 180                       | 7.1 | 4.4 | 0.6               | 0.29 | 8.1 | 24.7 | 180                       | 6.5 | 0.52 | 4.7 | 103.3 | 3.6 |
|            | 2.0 | 2.6           | 6.0   | 240                       | 7.4 | 5.2 | 0.7               | 0.30 | 8.4 | 24.9 | 240                       | 6.7 | 0.48 | 5.0 | 95.7  | 4.1 |
| 60         | 1.0 | 0.2           | 0.5   | 180                       | 6.7 | 4.4 | 0.7               | 0.35 | 7.9 | 19.4 | 180                       | 6.8 | 0.53 | 5.0 | 105.0 | 3.8 |
|            | 1.0 | 0.2           | 0.5   | 240                       | 7.0 | 5.3 | 0.8               | 0.36 | 8.2 | 19.6 | 240                       | 7.0 | 0.48 | 5.3 | 96.9  | 4.2 |
|            | 1.5 | 1.3           | 3.0   | 180                       | 6.9 | 4.5 | 0.6               | 0.33 | 8.0 | 21.1 | 180                       | 7.0 | 0.53 | 5.3 | 106.2 | 3.9 |
|            | 1.5 | 1.3           | 3.0   | 240                       | 7.2 | 5.3 | 0.7               | 0.34 | 8.3 | 21.3 | 240                       | 7.2 | 0.48 | 5.6 | 97.9  | 4.4 |
|            | 2.0 | 2.4           | 5.5   | 180                       | 6.9 | 4.5 | 0.6               | 0.32 | 8.0 | 21.9 | 180                       | 7.2 | 0.53 | 5.4 | 106.9 | 4.0 |
|            | 2.0 | 2.4           | 5.5   | 240                       | 7.2 | 5.3 | 0.7               | 0.33 | 8.3 | 22.1 | 240                       | 7.4 | 0.48 | 5.7 | 98.4  | 4.5 |
| 70         | 1.0 | 0.2           | 0.5   | 180                       | 6.4 | 4.4 | 0.7               | 0.39 | 7.7 | 16.5 | 180                       | 7.4 | 0.53 | 5.6 | 108.3 | 4.1 |
|            | 1.0 | 0.2           | 0.5   | 240                       | 6.6 | 5.2 | 0.8               | 0.40 | 8.0 | 16.6 | 240                       | 7.6 | 0.49 | 6.0 | 99.5  | 4.6 |
|            | 1.5 | 1.2           | 2.8   | 180                       | 6.6 | 4.4 | 0.7               | 0.36 | 7.8 | 18.0 | 180                       | 7.7 | 0.53 | 5.9 | 109.8 | 4.2 |
|            | 1.5 | 1.2           | 2.8   | 240                       | 6.8 | 5.3 | 0.8               | 0.38 | 8.1 | 18.2 | 240                       | 7.9 | 0.49 | 6.3 | 100.6 | 4.8 |
|            | 2.0 | 2.2           | 5.1   | 180                       | 6.7 | 4.4 | 0.7               | 0.35 | 7.9 | 18.9 | 180                       | 7.9 | 0.53 | 6.1 | 110.6 | 4.3 |
|            | 2.0 | 2.2           | 5.1   | 240                       | 6.9 | 5.3 | 0.8               | 0.37 | 8.2 | 19.0 | 240                       | 8.1 | 0.49 | 6.4 | 101.2 | 4.9 |
| 80         | 1.0 | 0.2           | 0.5   | 180                       | 5.9 | 4.2 | 0.7               | 0.43 | 7.4 | 13.7 | 180                       | 8.1 | 0.54 | 6.3 | 111.8 | 4.4 |
|            | 1.0 | 0.2           | 0.5   | 240                       | 6.2 | 5.0 | 0.8               | 0.45 | 7.7 | 13.8 | 240                       | 8.4 | 0.49 | 6.7 | 102.2 | 5.0 |
|            | 1.5 | 1.1           | 2.5   | 180                       | 6.1 | 4.3 | 0.7               | 0.41 | 7.5 | 15.1 | 180                       | 8.5 | 0.54 | 6.6 | 113.7 | 4.6 |
|            | 1.5 | 1.1           | 2.5   | 240                       | 6.4 | 5.1 | 0.8               | 0.42 | 7.8 | 15.2 | 240                       | 8.7 | 0.49 | 7.0 | 103.6 | 5.2 |
|            | 2.0 | 2.0           | 4.6   | 180                       | 6.3 | 4.3 | 0.7               | 0.40 | 7.6 | 15.8 | 180                       | 8.7 | 0.54 | 6.8 | 114.7 | 4.7 |
|            | 2.0 | 2.0           | 4.6   | 240                       | 6.5 | 5.2 | 0.8               | 0.41 | 7.9 | 16.0 | 240                       | 8.9 | 0.49 | 7.2 | 104.4 | 5.3 |
| 85         | 1.0 | 0.2           | 0.5   | 180                       | 5.7 | 4.1 | 0.7               | 0.46 | 7.2 | 12.5 | 180                       | 8.5 | 0.54 | 6.7 | 113.8 | 4.6 |
|            | 1.0 | 0.2           | 0.5   | 240                       | 5.9 | 4.9 | 0.8               | 0.47 | 7.5 | 12.6 | 240                       | 8.7 | 0.49 | 7.1 | 103.8 | 5.2 |
|            | 1.5 | 1.05          | 2.4   | 180                       | 5.9 | 4.2 | 0.7               | 0.43 | 7.4 | 13.8 | 180                       | 8.9 | 0.54 | 7.0 | 115.9 | 4.8 |
|            | 1.5 | 1.05          | 2.4   | 240                       | 6.2 | 5.0 | 0.8               | 0.45 | 7.7 | 13.9 | 240                       | 9.2 | 0.49 | 7.5 | 105.4 | 5.4 |
|            | 2.0 | 1.9           | 4.4   | 180                       | 6.0 | 4.2 | 0.7               | 0.42 | 7.5 | 14.5 | 180                       | 9.2 | 0.54 | 7.3 | 117.2 | 5.0 |
|            | 2.0 | 1.9           | 4.4   | 240                       | 6.3 | 5.1 | 0.8               | 0.43 | 7.8 | 14.6 | 240                       | 9.4 | 0.50 | 7.7 | 106.3 | 5.6 |
| 90         | 1.0 | 0.2           | 0.5   | 180                       | 5.4 | 4.0 | 0.7               | 0.48 | 7.1 | 11.3 | 180                       | 8.9 | 0.54 | 7.0 | 115.8 | 4.8 |
|            | 1.0 | 0.2           | 0.5   | 240                       | 5.6 | 4.8 | 0.8               | 0.50 | 7.3 | 11.4 | 240                       | 9.1 | 0.49 | 7.5 | 105.3 | 5.4 |
|            | 1.5 | 1.0           | 2.3   | 180                       | 5.7 | 4.1 | 0.7               | 0.46 | 7.2 | 12.4 | 180                       | 9.4 | 0.54 | 7.5 | 118.2 | 5.1 |
|            | 1.5 | 1.0           | 2.3   | 240                       | 5.9 | 4.9 | 0.8               | 0.47 | 7.5 | 12.5 | 240                       | 9.6 | 0.50 | 7.9 | 107.1 | 5.7 |
|            | 2.0 | 1.8           | 4.2   | 180                       | 5.8 | 4.2 | 0.7               | 0.44 | 7.3 | 13.1 | 180                       | 9.7 | 0.55 | 7.7 | 119.6 | 5.2 |
|            | 2.0 | 1.8           | 4.2   | 240                       | 6.0 | 5.0 | 0.8               | 0.46 | 7.6 | 13.2 | 240                       | 9.9 | 0.50 | 8.2 | 108.2 | 5.8 |
| 100        | 1.0 | 0.1           | 0.2   | 180                       | 4.9 | 3.7 | 0.8               | 0.53 | 6.7 | 9.2  | Operation Not Recommended |     |      |     |       |     |
|            | 1.0 | 0.1           | 0.2   | 240                       | 5.1 | 4.5 | 0.9               | 0.55 | 7.0 | 9.3  |                           |     |      |     |       |     |
|            | 1.5 | 0.8           | 1.8   | 180                       | 5.2 | 3.9 | 0.8               | 0.51 | 6.9 | 10.2 |                           |     |      |     |       |     |
|            | 1.5 | 0.8           | 1.8   | 240                       | 5.4 | 4.6 | 0.9               | 0.52 | 7.2 | 10.2 |                           |     |      |     |       |     |
|            | 2.0 | 1.6           | 3.7   | 180                       | 5.3 | 3.9 | 0.7               | 0.49 | 7.0 | 10.7 |                           |     |      |     |       |     |
|            | 2.0 | 1.6           | 3.7   | 240                       | 5.5 | 4.7 | 0.9               | 0.51 | 7.3 | 10.8 |                           |     |      |     |       |     |
| 110        | 1.0 | 0.1           | 0.2   | 180                       | 4.4 | 3.5 | 0.8               | 0.59 | 6.4 | 7.5  |                           |     |      |     |       |     |
|            | 1.0 | 0.1           | 0.2   | 240                       | 4.6 | 4.1 | 0.9               | 0.61 | 6.7 | 7.6  |                           |     |      |     |       |     |
|            | 1.5 | 0.7           | 1.6   | 180                       | 4.6 | 3.6 | 0.8               | 0.56 | 6.6 | 8.2  |                           |     |      |     |       |     |
|            | 1.5 | 0.7           | 1.6   | 240                       | 4.8 | 4.3 | 0.9               | 0.58 | 6.8 | 8.3  |                           |     |      |     |       |     |
|            | 2.0 | 1.4           | 3.2   | 180                       | 4.8 | 3.7 | 0.8               | 0.55 | 6.6 | 8.6  |                           |     |      |     |       |     |
|            | 2.0 | 1.4           | 3.2   | 240                       | 5.0 | 4.4 | 0.9               | 0.57 | 6.9 | 8.7  |                           |     |      |     |       |     |
| 120        | 1.0 | 0.1           | 0.2   | 180                       | 3.9 | 3.2 | 0.8               | 0.65 | 6.1 | 6.1  |                           |     |      |     |       |     |
|            | 1.0 | 0.1           | 0.2   | 240                       | 4.1 | 3.8 | 0.9               | 0.67 | 6.4 | 6.1  |                           |     |      |     |       |     |
|            | 1.5 | 0.6           | 1.4   | 180                       | 4.1 | 3.3 | 0.8               | 0.62 | 6.3 | 6.7  |                           |     |      |     |       |     |
|            | 1.5 | 0.6           | 1.4   | 240                       | 4.3 | 3.9 | 0.9               | 0.64 | 6.5 | 6.7  |                           |     |      |     |       |     |
|            | 2.0 | 1.2           | 2.8   | 180                       | 4.2 | 3.4 | 0.8               | 0.61 | 6.3 | 7.0  |                           |     |      |     |       |     |
|            | 2.0 | 1.2           | 2.8   | 240                       | 4.4 | 4.0 | 0.9               | 0.63 | 6.6 | 7.0  |                           |     |      |     |       |     |

#### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

#### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV009

### 350 CFM NOMINAL AIRFLOW COOLING/300 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM        | PRESSURE DROP |            | COOLING                   |      |     |                   |      |      |      | HEATING                   |            |              |            |              |            |
|------------|------------|---------------|------------|---------------------------|------|-----|-------------------|------|------|------|---------------------------|------------|--------------|------------|--------------|------------|
|            |            | PSI           | ft wg      | Airflow<br>CFM            | TC   | TSC | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC        | kW           | HE         | LAT          | COP        |
| 20         | 2.8<br>2.8 | 2.8<br>2.8    | 6.5<br>6.5 | Operation Not Recommended |      |     |                   |      |      |      | 225<br>300                | 5.7<br>5.8 | 0.69<br>0.63 | 3.5<br>3.7 | 93.3<br>88.0 | 2.4<br>2.7 |
| 30         | 1.4        | 0.8           | 1.8        | 225                       | 11.6 | 6.5 | 0.6               | 0.37 | 12.9 | 31.4 | 225                       | 6.6        | 0.71         | 4.3        | 97.0         | 2.7        |
|            | 1.4        | 0.8           | 1.8        | 300                       | 12.1 | 7.8 | 0.6               | 0.38 | 13.4 | 31.6 | 300                       | 6.7        | 0.65         | 4.6        | 90.8         | 3.0        |
|            | 2.1        | 1.5           | 3.5        | 225                       | 11.9 | 6.6 | 0.6               | 0.34 | 13.0 | 34.9 | 225                       | 6.9        | 0.72         | 4.5        | 98.2         | 2.8        |
|            | 2.1        | 1.5           | 3.5        | 300                       | 12.4 | 7.9 | 0.6               | 0.35 | 13.5 | 35.2 | 300                       | 7.0        | 0.66         | 4.8        | 91.7         | 3.1        |
|            | 2.8        | 2.7           | 6.2        | 225                       | 12.0 | 6.7 | 0.6               | 0.32 | 13.1 | 36.9 | 225                       | 7.0        | 0.72         | 4.7        | 98.8         | 2.8        |
|            | 2.8        | 2.7           | 6.2        | 300                       | 12.5 | 8.0 | 0.6               | 0.33 | 13.6 | 37.2 | 300                       | 7.2        | 0.66         | 5.0        | 92.2         | 3.2        |
| 40         | 1.4        | 0.8           | 1.7        | 225                       | 11.3 | 6.3 | 0.6               | 0.42 | 12.7 | 26.7 | 225                       | 7.7        | 0.74         | 5.3        | 101.9        | 3.1        |
|            | 1.4        | 0.8           | 1.7        | 300                       | 11.7 | 7.6 | 0.6               | 0.44 | 13.2 | 26.9 | 300                       | 8.0        | 0.67         | 5.7        | 94.5         | 3.5        |
|            | 2.1        | 1.5           | 3.4        | 225                       | 11.5 | 6.4 | 0.6               | 0.39 | 12.8 | 29.6 | 225                       | 8.1        | 0.74         | 5.6        | 103.2        | 3.2        |
|            | 2.1        | 1.5           | 3.4        | 300                       | 12.0 | 7.7 | 0.6               | 0.40 | 13.3 | 29.8 | 300                       | 8.3        | 0.68         | 6.0        | 95.6         | 3.6        |
|            | 2.8        | 2.6           | 5.9        | 225                       | 11.6 | 6.5 | 0.6               | 0.37 | 12.9 | 31.2 | 225                       | 8.3        | 0.75         | 5.8        | 104.0        | 3.2        |
|            | 2.8        | 2.6           | 5.9        | 300                       | 12.1 | 7.8 | 0.6               | 0.39 | 13.4 | 31.5 | 300                       | 8.5        | 0.68         | 6.2        | 96.2         | 3.6        |
| 50         | 1.4        | 0.7           | 1.6        | 225                       | 10.8 | 6.2 | 0.6               | 0.48 | 12.4 | 22.7 | 225                       | 8.9        | 0.76         | 6.4        | 106.4        | 3.4        |
|            | 1.4        | 0.7           | 1.6        | 300                       | 11.3 | 7.4 | 0.7               | 0.49 | 12.9 | 22.9 | 300                       | 9.1        | 0.69         | 6.7        | 98.0         | 3.8        |
|            | 2.1        | 1.4           | 3.2        | 225                       | 11.1 | 6.3 | 0.6               | 0.44 | 12.6 | 25.1 | 225                       | 9.2        | 0.76         | 6.7        | 107.9        | 3.5        |
|            | 2.1        | 1.4           | 3.2        | 300                       | 11.6 | 7.5 | 0.6               | 0.46 | 13.1 | 25.3 | 300                       | 9.5        | 0.70         | 7.1        | 99.2         | 4.0        |
|            | 2.8        | 2.4           | 5.6        | 225                       | 11.2 | 6.3 | 0.6               | 0.42 | 12.7 | 26.5 | 225                       | 9.4        | 0.77         | 6.9        | 108.8        | 3.6        |
|            | 2.8        | 2.4           | 5.6        | 300                       | 11.7 | 7.6 | 0.6               | 0.44 | 13.2 | 26.7 | 300                       | 9.7        | 0.70         | 7.3        | 99.8         | 4.0        |
| 60         | 1.4        | 0.7           | 1.5        | 225                       | 10.3 | 6.0 | 0.6               | 0.53 | 12.1 | 19.3 | 225                       | 9.9        | 0.77         | 7.3        | 110.7        | 3.8        |
|            | 1.4        | 0.7           | 1.5        | 300                       | 10.7 | 7.2 | 0.7               | 0.55 | 12.6 | 19.5 | 300                       | 10.2       | 0.71         | 7.8        | 101.4        | 4.2        |
|            | 2.1        | 1.3           | 3.0        | 225                       | 10.6 | 6.1 | 0.6               | 0.50 | 12.3 | 21.3 | 225                       | 10.3       | 0.78         | 7.7        | 112.4        | 3.9        |
|            | 2.1        | 1.3           | 3.0        | 300                       | 11.1 | 7.3 | 0.7               | 0.51 | 12.8 | 21.5 | 300                       | 10.6       | 0.71         | 8.2        | 102.7        | 4.4        |
|            | 2.8        | 2.3           | 5.3        | 225                       | 10.8 | 6.1 | 0.6               | 0.48 | 12.4 | 22.5 | 225                       | 10.5       | 0.78         | 7.9        | 113.3        | 3.9        |
|            | 2.8        | 2.3           | 5.3        | 300                       | 11.2 | 7.4 | 0.7               | 0.50 | 12.9 | 22.6 | 300                       | 10.8       | 0.71         | 8.4        | 103.3        | 4.4        |
| 70         | 1.4        | 0.6           | 1.5        | 225                       | 9.7  | 5.8 | 0.6               | 0.59 | 11.8 | 16.4 | 225                       | 10.9       | 0.79         | 8.2        | 114.9        | 4.1        |
|            | 1.4        | 0.6           | 1.5        | 300                       | 10.1 | 6.9 | 0.7               | 0.61 | 12.2 | 16.5 | 300                       | 11.2       | 0.72         | 8.7        | 104.5        | 4.6        |
|            | 2.1        | 1.2           | 2.8        | 225                       | 10.1 | 5.9 | 0.6               | 0.56 | 12.0 | 18.1 | 225                       | 11.3       | 0.79         | 8.6        | 116.7        | 4.2        |
|            | 2.1        | 1.2           | 2.8        | 300                       | 10.5 | 7.1 | 0.7               | 0.58 | 12.5 | 18.2 | 300                       | 11.6       | 0.72         | 9.2        | 105.9        | 4.7        |
|            | 2.8        | 2.2           | 5.0        | 225                       | 10.3 | 6.0 | 0.6               | 0.54 | 12.1 | 19.0 | 225                       | 11.6       | 0.80         | 8.9        | 117.6        | 4.3        |
|            | 2.8        | 2.2           | 5.0        | 300                       | 10.7 | 7.1 | 0.7               | 0.56 | 12.6 | 19.2 | 300                       | 11.9       | 0.73         | 9.4        | 106.7        | 4.8        |
| 80         | 1.4        | 0.6           | 1.4        | 225                       | 9.1  | 5.6 | 0.6               | 0.66 | 11.4 | 13.9 | 225                       | 11.9       | 0.80         | 9.1        | 118.9        | 4.3        |
|            | 1.4        | 0.6           | 1.4        | 300                       | 9.5  | 6.7 | 0.7               | 0.68 | 11.8 | 14.0 | 300                       | 12.2       | 0.73         | 9.7        | 107.6        | 4.9        |
|            | 2.1        | 1.1           | 2.6        | 225                       | 9.5  | 5.7 | 0.6               | 0.62 | 11.6 | 15.3 | 225                       | 12.3       | 0.81         | 9.6        | 120.8        | 4.5        |
|            | 2.1        | 1.1           | 2.6        | 300                       | 9.9  | 6.8 | 0.7               | 0.64 | 12.1 | 15.4 | 300                       | 12.7       | 0.74         | 10.2       | 109.1        | 5.0        |
|            | 2.8        | 2.0           | 4.7        | 225                       | 9.7  | 5.8 | 0.6               | 0.60 | 11.7 | 16.1 | 225                       | 12.6       | 0.81         | 9.8        | 121.9        | 4.5        |
|            | 2.8        | 2.0           | 4.7        | 300                       | 10.1 | 6.9 | 0.7               | 0.62 | 12.2 | 16.2 | 300                       | 12.9       | 0.74         | 10.4       | 109.9        | 5.1        |
| 85         | 1.4        | 0.6           | 1.3        | 225                       | 8.8  | 5.5 | 0.6               | 0.69 | 11.1 | 12.8 | 225                       | 12.3       | 0.81         | 9.6        | 120.8        | 4.5        |
|            | 1.4        | 0.6           | 1.3        | 300                       | 9.1  | 6.6 | 0.7               | 0.71 | 11.6 | 12.9 | 300                       | 12.7       | 0.74         | 10.2       | 109.1        | 5.0        |
|            | 2.1        | 1.1           | 2.5        | 225                       | 9.2  | 5.6 | 0.6               | 0.65 | 11.4 | 14.1 | 225                       | 12.8       | 0.82         | 10.0       | 122.8        | 4.6        |
|            | 2.1        | 1.1           | 2.5        | 300                       | 9.5  | 6.7 | 0.7               | 0.67 | 11.8 | 14.2 | 300                       | 13.2       | 0.75         | 10.6       | 110.7        | 5.2        |
|            | 2.8        | 1.9           | 4.5        | 225                       | 9.3  | 5.7 | 0.6               | 0.63 | 11.5 | 14.8 | 225                       | 13.1       | 0.82         | 10.3       | 123.9        | 4.7        |
|            | 2.8        | 1.9           | 4.5        | 300                       | 9.7  | 6.8 | 0.7               | 0.65 | 12.0 | 14.9 | 300                       | 13.5       | 0.75         | 10.9       | 111.5        | 5.2        |
| 90         | 1.4        | 0.6           | 1.3        | 225                       | 8.4  | 5.4 | 0.6               | 0.72 | 10.9 | 11.7 | 225                       | 12.8       | 0.82         | 10.0       | 122.8        | 4.6        |
|            | 1.4        | 0.6           | 1.3        | 300                       | 8.8  | 6.4 | 0.7               | 0.75 | 11.3 | 11.8 | 300                       | 13.2       | 0.75         | 10.6       | 110.6        | 5.2        |
|            | 2.1        | 1.1           | 2.5        | 225                       | 8.8  | 5.5 | 0.6               | 0.69 | 11.2 | 12.9 | 225                       | 13.3       | 0.83         | 10.5       | 124.9        | 4.7        |
|            | 2.1        | 1.1           | 2.5        | 300                       | 9.2  | 6.6 | 0.7               | 0.71 | 11.6 | 13.0 | 300                       | 13.7       | 0.76         | 11.1       | 112.3        | 5.3        |
|            | 2.8        | 1.9           | 4.3        | 225                       | 9.0  | 5.6 | 0.6               | 0.67 | 11.3 | 13.5 | 225                       | 13.6       | 0.83         | 10.7       | 126.0        | 4.8        |
|            | 2.8        | 1.9           | 4.3        | 300                       | 9.4  | 6.7 | 0.7               | 0.69 | 11.7 | 13.6 | 300                       | 14.0       | 0.76         | 11.4       | 113.1        | 5.4        |
| 100        | 1.4        | 0.5           | 1.2        | 225                       | 7.7  | 5.1 | 0.7               | 0.79 | 10.4 | 9.7  | Operation Not Recommended |            |              |            |              |            |
|            | 1.4        | 0.5           | 1.2        | 300                       | 8.0  | 6.2 | 0.8               | 0.82 | 10.8 | 9.8  |                           |            |              |            |              |            |
|            | 2.1        | 1.0           | 2.3        | 225                       | 8.1  | 5.3 | 0.7               | 0.75 | 10.7 | 10.8 |                           |            |              |            |              |            |
|            | 2.1        | 1.0           | 2.3        | 300                       | 8.4  | 6.3 | 0.7               | 0.78 | 11.1 | 10.8 |                           |            |              |            |              |            |
|            | 2.8        | 1.7           | 4.0        | 225                       | 8.3  | 5.3 | 0.6               | 0.74 | 10.8 | 11.3 |                           |            |              |            |              |            |
|            | 2.8        | 1.7           | 4.0        | 300                       | 8.7  | 6.4 | 0.7               | 0.76 | 11.2 | 11.4 |                           |            |              |            |              |            |
| 110        | 1.4        | 0.5           | 1.1        | 225                       | 6.9  | 4.9 | 0.7               | 0.86 | 9.9  | 8.0  |                           |            |              |            |              |            |
|            | 1.4        | 0.5           | 1.1        | 300                       | 7.2  | 5.8 | 0.8               | 0.89 | 10.3 | 8.1  |                           |            |              |            |              |            |
|            | 2.1        | 0.9           | 2.1        | 225                       | 7.3  | 5.0 | 0.7               | 0.83 | 10.2 | 8.9  |                           |            |              |            |              |            |
|            | 2.1        | 0.9           | 2.1        | 300                       | 7.6  | 6.0 | 0.8               | 0.85 | 10.6 | 8.9  |                           |            |              |            |              |            |
|            | 2.8        | 1.6           | 3.7        | 225                       | 7.5  | 5.1 | 0.7               | 0.81 | 10.3 | 9.3  |                           |            |              |            |              |            |
|            | 2.8        | 1.6           | 3.7        | 300                       | 7.9  | 6.1 | 0.8               | 0.84 | 10.7 | 9.4  |                           |            |              |            |              |            |
| 120        | 1.4        | 0.4           | 1.0        | 225                       | 6.1  | 4.5 | 0.7               | 0.94 | 9.3  | 6.5  |                           |            |              |            |              |            |
|            | 1.4        | 0.4           | 1.0        | 300                       | 6.4  | 5.4 | 0.8               | 0.97 | 9.7  | 6.6  |                           |            |              |            |              |            |
|            | 2.1        | 0.8           | 1.9        | 225                       | 6.5  | 4.7 | 0.7               | 0.90 | 9.6  | 7.2  |                           |            |              |            |              |            |
|            | 2.1        | 0.8           | 1.9        | 300                       | 6.8  | 5.6 | 0.8               | 0.93 | 10.0 | 7.3  |                           |            |              |            |              |            |
|            | 2.8        | 1.5           | 3.4        | 225                       | 6.7  | 4.8 | 0.7               | 0.88 | 9.7  | 7.6  |                           |            |              |            |              |            |
|            | 2.8        | 1.5           | 3.4        | 300                       | 7.0  | 5.7 | 0.8               | 0.91 | 10.1 | 7.7  |                           |            |              |            |              |            |

#### LEGEND

|       |   |   |
|-------|---|---|
| AHRI  | — | Air Conditioning, Heating and Refrigeration Institute |
| COP   | — | Coefficient of Performance                            |
| db    | — | Dry Bulb  |
| EER   | — | Energy Efficiency Ratio                               |
| EWT   | — | Entering Water Temperature                            |
| GPM   | — | Gallons Per Minute                                    |
| HE    | — | Heat of Extraction (MBtuh)                            |
| ISO   | — | International Organization for Standardization        |
| LAT   | — | Leaving Air Temperature (F)                           |
| MBtuh | — | Btuh in Thousands                                     |
| TC    | — | Total Capacity (MBtuh)                                |
| THC   | — | Total Heating Capacity (MBtuh)                        |
| THR   | — | Total Heat Rejection (MBtuh)                          |
| TSC   | — | Total Sensible Capacity (MBtuh)                       |
| wb    | — | Wet Bulb  |

#### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV012

## 350 CFM NOMINAL AIRFLOW COOLING/350 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM        | PRESSURE DROP |            | COOLING                   |      |     |                   |      |      |      | HEATING                   |            |              |            |              |            |
|------------|------------|---------------|------------|---------------------------|------|-----|-------------------|------|------|------|---------------------------|------------|--------------|------------|--------------|------------|
|            |            | PSI           | ft wg      | Airflow<br>CFM            | TC   | TSC | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC        | kW           | HE         | LAT          | COP        |
| 20         | 3.5<br>3.5 | 4.0<br>4.0    | 9.2<br>9.2 | Operation Not Recommended |      |     |                   |      |      |      | 265<br>350                | 7.7<br>8.0 | 0.89<br>0.82 | 4.9<br>5.2 | 97.1<br>91.0 | 2.5<br>2.8 |
| 30         | 1.8        | 0.6           | 1.4        | 265                       | 12.1 | 6.5 | 0.5               | 0.50 | 13.8 | 24.4 | 265                       | 8.9        | 0.92         | 5.9        | 101.0        | 2.8        |
|            | 1.8        | 0.6           | 1.4        | 350                       | 12.6 | 7.8 | 0.6               | 0.51 | 14.4 | 24.6 | 350                       | 9.1        | 0.85         | 6.3        | 94.1         | 3.2        |
|            | 2.6        | 2.1           | 4.8        | 265                       | 12.3 | 6.6 | 0.5               | 0.48 | 13.9 | 25.9 | 265                       | 9.3        | 0.94         | 6.2        | 102.4        | 2.9        |
|            | 2.6        | 2.1           | 4.8        | 350                       | 12.8 | 7.9 | 0.6               | 0.49 | 14.5 | 26.1 | 350                       | 9.5        | 0.86         | 6.6        | 95.1         | 3.3        |
|            | 3.5        | 3.8           | 8.8        | 265                       | 12.7 | 6.8 | 0.5               | 0.47 | 14.3 | 27.3 | 265                       | 9.5        | 0.94         | 6.4        | 103.1        | 2.9        |
|            | 3.5        | 3.8           | 8.8        | 350                       | 13.3 | 8.1 | 0.6               | 0.48 | 14.9 | 27.3 | 350                       | 9.7        | 0.86         | 6.8        | 95.7         | 3.3        |
| 40         | 1.8        | 0.6           | 1.3        | 265                       | 12.7 | 6.9 | 0.5               | 0.55 | 14.6 | 23.3 | 265                       | 10.3       | 0.97         | 7.2        | 106.0        | 3.1        |
|            | 1.8        | 0.6           | 1.3        | 350                       | 13.2 | 8.2 | 0.6               | 0.56 | 15.2 | 23.5 | 350                       | 10.6       | 0.88         | 7.6        | 98.0         | 3.5        |
|            | 2.6        | 2.0           | 4.6        | 265                       | 12.8 | 6.9 | 0.5               | 0.52 | 14.6 | 24.8 | 265                       | 10.7       | 0.98         | 7.5        | 107.4        | 3.2        |
|            | 2.6        | 2.0           | 4.6        | 350                       | 13.3 | 8.3 | 0.6               | 0.53 | 15.2 | 25.0 | 350                       | 11.0       | 0.89         | 8.0        | 99.1         | 3.6        |
|            | 3.5        | 3.6           | 8.3        | 265                       | 12.9 | 6.9 | 0.5               | 0.50 | 14.6 | 25.6 | 265                       | 10.9       | 0.98         | 7.7        | 108.1        | 3.2        |
|            | 3.5        | 3.6           | 8.3        | 350                       | 13.5 | 8.3 | 0.6               | 0.52 | 15.2 | 25.8 | 350                       | 11.2       | 0.90         | 8.1        | 96.6         | 3.6        |
| 50         | 1.8        | 0.5           | 1.1        | 265                       | 12.7 | 6.9 | 0.5               | 0.61 | 14.8 | 21.0 | 265                       | 11.5       | 1.00         | 8.2        | 110.2        | 3.4        |
|            | 1.8        | 0.5           | 1.1        | 350                       | 13.2 | 8.3 | 0.6               | 0.63 | 15.4 | 21.2 | 350                       | 11.8       | 0.92         | 8.7        | 101.2        | 3.8        |
|            | 2.6        | 1.9           | 4.3        | 265                       | 12.8 | 7.0 | 0.5               | 0.57 | 14.8 | 22.6 | 265                       | 11.9       | 1.01         | 8.5        | 111.5        | 3.4        |
|            | 2.6        | 1.9           | 4.3        | 350                       | 13.3 | 8.3 | 0.6               | 0.59 | 15.4 | 22.7 | 350                       | 12.2       | 0.93         | 9.0        | 102.2        | 3.9        |
|            | 3.5        | 3.4           | 7.9        | 265                       | 12.9 | 7.0 | 0.5               | 0.55 | 14.8 | 23.4 | 265                       | 12.0       | 1.02         | 8.7        | 112.1        | 3.5        |
|            | 3.5        | 3.4           | 7.9        | 350                       | 13.5 | 8.4 | 0.6               | 0.57 | 15.4 | 23.5 | 350                       | 12.4       | 0.93         | 9.2        | 102.7        | 3.9        |
| 60         | 1.8        | 0.4           | 1.0        | 265                       | 12.5 | 6.9 | 0.5               | 0.67 | 14.8 | 18.6 | 265                       | 12.5       | 1.03         | 9.0        | 113.6        | 3.5        |
|            | 1.8        | 0.4           | 1.0        | 350                       | 13.0 | 8.2 | 0.6               | 0.69 | 15.4 | 18.8 | 350                       | 12.8       | 0.94         | 9.6        | 103.9        | 4.0        |
|            | 2.6        | 1.8           | 4.1        | 265                       | 12.7 | 6.9 | 0.5               | 0.63 | 14.9 | 20.2 | 265                       | 12.8       | 1.04         | 9.3        | 114.6        | 3.6        |
|            | 2.6        | 1.8           | 4.1        | 350                       | 13.3 | 8.3 | 0.6               | 0.65 | 15.5 | 20.3 | 350                       | 13.1       | 0.95         | 9.9        | 104.7        | 4.0        |
|            | 3.5        | 3.2           | 7.4        | 265                       | 12.8 | 7.0 | 0.5               | 0.61 | 14.9 | 20.9 | 265                       | 12.9       | 1.05         | 9.4        | 115.1        | 3.6        |
|            | 3.5        | 3.2           | 7.4        | 350                       | 13.4 | 8.4 | 0.6               | 0.63 | 15.5 | 21.1 | 350                       | 13.3       | 0.96         | 10.0       | 105.1        | 4.1        |
| 70         | 1.8        | 0.4           | 0.9        | 265                       | 12.0 | 6.7 | 0.6               | 0.75 | 14.5 | 16.1 | 265                       | 13.2       | 1.06         | 9.7        | 116.1        | 3.7        |
|            | 1.8        | 0.4           | 0.9        | 350                       | 12.5 | 8.0 | 0.6               | 0.77 | 15.1 | 16.2 | 350                       | 13.5       | 0.97         | 10.3       | 105.8        | 4.1        |
|            | 2.6        | 1.6           | 3.8        | 265                       | 12.3 | 6.8 | 0.6               | 0.70 | 14.7 | 17.5 | 265                       | 13.4       | 1.06         | 9.9        | 116.9        | 3.7        |
|            | 2.6        | 1.6           | 3.8        | 350                       | 12.8 | 8.1 | 0.6               | 0.73 | 15.3 | 17.7 | 350                       | 13.8       | 0.97         | 10.5       | 106.4        | 4.1        |
|            | 3.5        | 3.0           | 6.9        | 265                       | 12.5 | 6.9 | 0.5               | 0.68 | 14.8 | 18.3 | 265                       | 13.5       | 1.07         | 9.9        | 117.2        | 3.7        |
|            | 3.5        | 3.0           | 6.9        | 350                       | 13.0 | 8.2 | 0.6               | 0.70 | 15.4 | 18.4 | 350                       | 13.9       | 0.98         | 10.6       | 106.7        | 4.2        |
| 80         | 1.8        | 0.3           | 0.7        | 265                       | 11.3 | 6.5 | 0.6               | 0.83 | 13.8 | 13.6 | 265                       | 13.7       | 1.07         | 10.2       | 118.1        | 3.7        |
|            | 1.8        | 0.3           | 0.7        | 350                       | 11.7 | 7.8 | 0.7               | 0.85 | 14.7 | 13.7 | 350                       | 14.0       | 0.98         | 10.8       | 107.1        | 4.2        |
|            | 2.6        | 1.5           | 3.5        | 265                       | 11.7 | 6.6 | 0.6               | 0.78 | 14.3 | 15.0 | 265                       | 13.8       | 1.08         | 10.2       | 118.2        | 3.8        |
|            | 2.6        | 1.5           | 3.5        | 350                       | 12.2 | 7.9 | 0.6               | 0.81 | 14.9 | 15.1 | 350                       | 14.2       | 0.98         | 10.9       | 107.4        | 4.2        |
|            | 3.5        | 2.8           | 6.5        | 265                       | 11.9 | 6.7 | 0.6               | 0.76 | 14.5 | 15.7 | 265                       | 13.8       | 1.08         | 10.3       | 118.3        | 3.8        |
|            | 3.5        | 2.8           | 6.5        | 350                       | 12.4 | 8.0 | 0.6               | 0.76 | 15.0 | 15.8 | 350                       | 14.2       | 0.98         | 10.9       | 107.6        | 4.2        |
| 85         | 1.8        | 0.3           | 0.7        | 265                       | 10.9 | 6.4 | 0.6               | 0.87 | 13.8 | 12.5 | 265                       | 13.8       | 1.08         | 10.2       | 118.1        | 3.8        |
|            | 1.8        | 0.3           | 0.7        | 350                       | 11.3 | 7.6 | 0.7               | 0.90 | 14.4 | 12.6 | 350                       | 14.1       | 0.98         | 10.8       | 107.4        | 4.2        |
|            | 2.6        | 1.5           | 3.4        | 265                       | 11.3 | 6.5 | 0.6               | 0.82 | 14.1 | 13.8 | 265                       | 13.8       | 1.08         | 10.2       | 118.4        | 3.8        |
|            | 2.6        | 1.5           | 3.4        | 350                       | 11.8 | 7.8 | 0.7               | 0.85 | 14.7 | 13.9 | 350                       | 14.2       | 0.98         | 10.9       | 107.6        | 4.2        |
|            | 3.5        | 2.7           | 6.3        | 265                       | 11.5 | 6.5 | 0.6               | 0.80 | 14.2 | 14.5 | 265                       | 13.9       | 1.08         | 10.3       | 118.5        | 3.8        |
|            | 3.5        | 2.7           | 6.3        | 350                       | 12.0 | 7.8 | 0.7               | 0.83 | 14.8 | 14.6 | 350                       | 14.2       | 0.98         | 10.9       | 107.7        | 4.2        |
| 90         | 1.8        | 0.3           | 0.6        | 265                       | 10.4 | 6.2 | 0.6               | 0.91 | 13.5 | 11.4 | 265                       | 13.9       | 1.08         | 10.3       | 118.5        | 3.8        |
|            | 1.8        | 0.3           | 0.6        | 350                       | 10.9 | 7.5 | 0.7               | 0.94 | 14.1 | 11.5 | 350                       | 14.3       | 0.99         | 10.9       | 107.7        | 4.2        |
|            | 2.6        | 1.4           | 3.3        | 265                       | 10.9 | 6.4 | 0.6               | 0.87 | 13.9 | 12.6 | 265                       | 13.9       | 1.08         | 10.3       | 118.6        | 3.8        |
|            | 2.6        | 1.4           | 3.3        | 350                       | 11.4 | 7.6 | 0.7               | 0.89 | 14.4 | 12.7 | 350                       | 14.3       | 0.98         | 10.9       | 107.7        | 4.3        |
|            | 3.5        | 2.6           | 6.0        | 265                       | 11.1 | 6.4 | 0.6               | 0.84 | 14.0 | 13.2 | 265                       | 13.9       | 1.07         | 10.3       | 118.6        | 3.8        |
|            | 3.5        | 2.6           | 6.0        | 350                       | 11.6 | 7.7 | 0.7               | 0.87 | 14.6 | 13.3 | 350                       | 14.3       | 0.98         | 10.9       | 107.8        | 4.3        |
| 100        | 1.8        | 0.2           | 0.5        | 265                       | 9.5  | 6.0 | 0.6               | 1.00 | 12.9 | 9.5  | Operation Not Recommended |            |              |            |              |            |
|            | 1.8        | 0.2           | 0.5        | 350                       | 9.9  | 7.2 | 0.7               | 1.04 | 13.4 | 9.5  |                           |            |              |            |              |            |
|            | 2.6        | 1.3           | 3.0        | 265                       | 10.0 | 6.1 | 0.6               | 0.96 | 13.3 | 10.5 |                           |            |              |            |              |            |
|            | 2.6        | 1.3           | 3.0        | 350                       | 10.4 | 7.3 | 0.7               | 0.99 | 13.8 | 10.5 |                           |            |              |            |              |            |
|            | 3.5        | 2.4           | 5.6        | 265                       | 10.2 | 6.2 | 0.6               | 0.93 | 13.4 | 11.0 |                           |            |              |            |              |            |
|            | 3.5        | 2.4           | 5.6        | 350                       | 10.7 | 7.4 | 0.7               | 0.96 | 14.0 | 11.1 |                           |            |              |            |              |            |
| 110        | 1.8        | 0.1           | 0.3        | 265                       | 8.5  | 5.7 | 0.7               | 1.10 | 12.3 | 7.7  |                           |            |              |            |              |            |
|            | 1.8        | 0.1           | 0.3        | 350                       | 8.9  | 6.9 | 0.8               | 1.14 | 12.8 | 7.8  |                           |            |              |            |              |            |
|            | 2.6        | 1.2           | 2.7        | 265                       | 9.0  | 5.9 | 0.7               | 1.05 | 12.6 | 8.6  |                           |            |              |            |              |            |
|            | 2.6        | 1.2           | 2.7        | 350                       | 9.4  | 7.0 | 0.7               | 1.09 | 13.1 | 8.6  |                           |            |              |            |              |            |
|            | 3.5        | 2.2           | 5.1        | 265                       | 9.3  | 5.9 | 0.6               | 1.03 | 12.8 | 9.0  |                           |            |              |            |              |            |
|            | 3.5        | 2.2           | 5.1        | 350                       | 9.6  | 7.1 | 0.7               | 1.06 | 13.3 | 9.1  |                           |            |              |            |              |            |
| 120        | 1.8        | 0.1           | 0.2        | 265                       | 7.5  | 5.5 | 0.7               | 1.20 | 11.6 | 6.2  |                           |            |              |            |              |            |
|            | 1.8        | 0.1           | 0.2        | 350                       | 7.8  | 6.6 | 0.8               | 1.24 | 12.0 | 6.3  |                           |            |              |            |              |            |
|            | 2.6        | 1.1           | 2.5        | 265                       | 8.0  | 5.6 | 0.7               | 1.15 | 11.9 | 6.9  |                           |            |              |            |              |            |
|            | 2.6        | 1.1           | 2.5        | 350                       | 8.3  | 6.7 | 0.8               | 1.19 | 12.4 | 7.0  |                           |            |              |            |              |            |
|            | 3.5        | 2.0           | 4.6        | 265                       | 8.2  | 5.7 | 0.7               | 1.13 | 12.1 | 7.3  |                           |            |              |            |              |            |
|            | 3.5        | 2.0           | 4.6        | 350                       | 8.6  | 6.8 | 0.8               | 1.16 | 12.5 | 7.3  |                           |            |              |            |              |            |

### LEGEND

|        |   |   |
|--------|---|---|
| AHRI   | — | Air Conditioning, Heating and Refrigeration Institute |
| COP    | — | Coefficient of Performance                            |
| db     | — | Dry Bulb  |
| EER    | — | Energy Efficiency Ratio                               |
| EWT    | — | Entering Water Temperature                            |
| GPM    | — | Gallons Per Minute                                    |
| HE     | — | Heat of Extraction (MBtu/h)                           |
| ISO    | — | International Organization for Standardization        |
| LAT    | — | Leaving Air Temperature (F)                           |
| MBtu/h | — | Btu/h in Thousands                                    |
| TC     | — | Total Capacity (MBtu/h)                               |
| THC    | — | Total Heating Capacity (MBtu/h)                       |
| THR    | — | Total Heat Rejection (MBtu/h)                         |
| TSC    | — | Total Sensible Capacity (MBtu/h)                      |
| wb     | — | Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD018

### 600 CFM NOMINAL AIRFLOW COOLING/600 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM        | PRESSURE DROP |            | COOLING                   |      |      |                   |      |      |      | HEATING                   |              |              |            |              |            |
|------------|------------|---------------|------------|---------------------------|------|------|-------------------|------|------|------|---------------------------|--------------|--------------|------------|--------------|------------|
|            |            | PSI           | ft wg      | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC          | kW           | HE         | LAT          | COP        |
| 20         | 5.5<br>5.5 | 3.9<br>3.9    | 9.0<br>9.0 | Operation Not Recommended |      |      |                   |      |      |      | 450<br>600                | 12.2<br>12.5 | 1.36<br>1.24 | 7.8<br>8.3 | 95.0<br>89.3 | 2.6<br>2.9 |
| 30         | 2.8        | 0.7           | 1.6        | 450                       | 10.7 | 16.8 | 0.81              | 0.78 | 23.3 | 26.6 | 450                       | 13.7         | 1.40         | 9.2        | 98.1         | 2.9        |
|            | 2.8        | 0.7           | 1.6        | 600                       | 21.5 | 14.0 | 0.65              | 0.80 | 24.3 | 26.8 | 600                       | 14.0         | 1.28         | 9.7        | 91.7         | 3.2        |
|            | 4.1        | 2.1           | 4.9        | 450                       | 21.0 | 16.8 | 0.80              | 0.74 | 23.5 | 28.4 | 450                       | 14.2         | 1.41         | 9.6        | 99.3         | 2.9        |
|            | 4.1        | 2.1           | 4.9        | 600                       | 21.8 | 14.1 | 0.64              | 0.76 | 24.4 | 28.6 | 600                       | 14.6         | 1.29         | 10.2       | 92.5         | 3.3        |
|            | 5.5        | 3.5           | 8.1        | 450                       | 21.2 | 16.8 | 0.80              | 0.72 | 23.6 | 29.3 | 450                       | 14.5         | 1.42         | 9.9        | 99.9         | 3.0        |
|            | 5.5        | 3.5           | 8.1        | 600                       | 22.0 | 14.1 | 0.64              | 0.75 | 24.6 | 29.6 | 600                       | 14.9         | 1.30         | 10.5       | 93.0         | 3.4        |
| 40         | 2.8        | 0.6           | 1.4        | 450                       | 20.8 | 17.2 | 0.83              | 0.85 | 23.7 | 24.5 | 450                       | 15.8         | 1.44         | 11.1       | 102.6        | 3.2        |
|            | 2.8        | 0.6           | 1.4        | 600                       | 21.7 | 14.4 | 0.66              | 0.88 | 24.6 | 24.7 | 600                       | 16.3         | 1.32         | 11.8       | 95.1         | 3.6        |
|            | 4.1        | 2.0           | 4.6        | 450                       | 21.0 | 17.2 | 0.82              | 0.81 | 23.7 | 26.0 | 450                       | 16.5         | 1.45         | 11.7       | 103.9        | 3.3        |
|            | 4.1        | 2.0           | 4.6        | 600                       | 21.8 | 14.4 | 0.66              | 0.83 | 24.7 | 26.2 | 600                       | 16.9         | 1.33         | 12.4       | 96.1         | 3.7        |
|            | 5.5        | 3.2           | 7.4        | 450                       | 21.2 | 17.3 | 0.82              | 0.79 | 23.9 | 26.9 | 450                       | 16.8         | 1.46         | 12.0       | 104.7        | 3.4        |
|            | 5.5        | 3.2           | 7.4        | 600                       | 22.9 | 14.5 | 0.66              | 0.81 | 24.8 | 27.1 | 600                       | 17.3         | 1.33         | 12.8       | 96.7         | 3.8        |
| 50         | 2.8        | 0.5           | 1.2        | 450                       | 20.6 | 17.3 | 0.84              | 0.95 | 23.9 | 21.8 | 450                       | 18.0         | 1.47         | 13.1       | 107.0        | 3.6        |
|            | 2.8        | 0.5           | 1.2        | 600                       | 21.5 | 14.5 | 0.67              | 0.98 | 24.8 | 22.0 | 600                       | 18.5         | 1.35         | 13.9       | 92.5         | 4.0        |
|            | 4.1        | 1.7           | 3.9        | 450                       | 21.0 | 17.5 | 0.83              | 0.89 | 24.0 | 23.5 | 450                       | 18.7         | 1.48         | 13.8       | 108.6        | 3.7        |
|            | 4.1        | 1.7           | 3.9        | 600                       | 21.8 | 14.6 | 0.67              | 0.92 | 25.0 | 23.7 | 600                       | 19.2         | 1.35         | 14.6       | 99.7         | 4.2        |
|            | 5.5        | 2.8           | 6.5        | 450                       | 21.2 | 17.5 | 0.83              | 0.86 | 24.0 | 24.4 | 450                       | 19.2         | 1.49         | 14.2       | 109.4        | 3.8        |
|            | 5.5        | 2.8           | 6.5        | 600                       | 22.1 | 14.6 | 0.67              | 0.89 | 25.0 | 24.6 | 600                       | 19.7         | 1.36         | 15.1       | 100.4        | 4.2        |
| 60         | 2.8        | 0.3           | 0.7        | 450                       | 19.9 | 16.8 | 0.85              | 1.05 | 23.5 | 18.9 | 450                       | 20.1         | 1.50         | 15.1       | 111.4        | 3.9        |
|            | 2.8        | 0.3           | 0.7        | 600                       | 20.7 | 14.1 | 0.68              | 1.09 | 24.4 | 19.1 | 600                       | 20.7         | 1.37         | 16.0       | 101.9        | 4.4        |
|            | 4.1        | 1.5           | 3.5        | 450                       | 20.4 | 17.2 | 0.84              | 0.99 | 23.7 | 20.6 | 450                       | 21.0         | 1.51         | 15.9       | 113.3        | 4.1        |
|            | 4.1        | 1.5           | 3.5        | 600                       | 21.2 | 14.3 | 0.68              | 1.02 | 24.7 | 20.8 | 600                       | 21.6         | 1.38         | 16.9       | 103.3        | 4.6        |
|            | 5.5        | 2.6           | 6.0        | 450                       | 20.6 | 17.3 | 0.84              | 0.96 | 23.8 | 21.5 | 450                       | 21.5         | 1.52         | 16.4       | 114.3        | 4.1        |
|            | 5.5        | 2.6           | 6.0        | 600                       | 21.4 | 14.4 | 0.67              | 0.99 | 24.8 | 21.7 | 600                       | 22.1         | 1.39         | 17.4       | 104.1        | 4.7        |
| 70         | 2.8        | 0.3           | 0.7        | 450                       | 18.9 | 16.2 | 0.86              | 1.17 | 22.9 | 16.1 | 450                       | 22.3         | 1.54         | 17.1       | 115.9        | 4.3        |
|            | 2.8        | 0.3           | 0.7        | 600                       | 19.7 | 13.5 | 0.69              | 1.21 | 23.8 | 16.2 | 600                       | 22.9         | 1.40         | 18.1       | 105.4        | 4.8        |
|            | 4.1        | 1.4           | 3.2        | 450                       | 19.5 | 16.6 | 0.85              | 1.10 | 23.2 | 17.7 | 450                       | 23.4         | 1.56         | 18.0       | 118.1        | 4.4        |
|            | 4.1        | 1.4           | 3.2        | 600                       | 20.3 | 13.8 | 0.68              | 1.10 | 24.2 | 17.9 | 600                       | 24.0         | 1.43         | 19.1       | 107.0        | 4.9        |
|            | 5.5        | 2.4           | 5.5        | 450                       | 19.8 | 16.8 | 0.85              | 1.07 | 23.4 | 18.6 | 450                       | 23.9         | 1.57         | 18.5       | 119.3        | 4.5        |
|            | 5.5        | 2.4           | 5.5        | 600                       | 20.6 | 14.0 | 0.68              | 1.10 | 24.3 | 18.7 | 600                       | 24.6         | 1.44         | 19.7       | 107.9        | 5.0        |
| 80         | 2.8        | 0.2           | 0.5        | 450                       | 17.7 | 15.0 | 0.88              | 1.31 | 22.2 | 13.6 | 450                       | 24.6         | 1.59         | 19.1       | 120.6        | 4.5        |
|            | 2.8        | 0.2           | 0.5        | 600                       | 18.5 | 12.6 | 0.70              | 1.35 | 23.8 | 13.7 | 600                       | 25.2         | 1.46         | 20.3       | 108.9        | 5.1        |
|            | 4.1        | 1.2           | 2.8        | 450                       | 18.4 | 15.5 | 0.87              | 1.23 | 23.2 | 15.0 | 450                       | 25.8         | 1.63         | 20.2       | 123.1        | 4.6        |
|            | 4.1        | 1.2           | 2.8        | 600                       | 19.2 | 12.9 | 0.70              | 1.27 | 24.1 | 15.1 | 600                       | 26.5         | 1.49         | 21.4       | 110.9        | 5.2        |
|            | 5.5        | 2.2           | 5.1        | 450                       | 18.7 | 15.7 | 0.86              | 1.19 | 23.4 | 15.7 | 450                       | 26.5         | 1.66         | 20.7       | 124.5        | 4.7        |
|            | 5.5        | 2.2           | 5.1        | 600                       | 19.5 | 13.1 | 0.69              | 1.23 | 24.3 | 15.9 | 600                       | 27.2         | 1.52         | 22.0       | 111.9        | 5.3        |
| 85         | 2.8        | 0.2           | 0.5        | 450                       | 17.1 | 15.0 | 0.88              | 1.39 | 21.9 | 12.4 | 450                       | 25.8         | 1.63         | 20.1       | 123.0        | 4.6        |
|            | 2.8        | 0.2           | 0.5        | 600                       | 17.1 | 12.6 | 0.70              | 1.43 | 22.7 | 12.5 | 600                       | 26.4         | 1.49         | 21.3       | 110.8        | 5.2        |
|            | 4.1        | 1.2           | 2.7        | 450                       | 17.8 | 15.5 | 0.87              | 1.30 | 22.2 | 13.7 | 450                       | 27.1         | 1.69         | 21.2       | 125.7        | 4.7        |
|            | 4.1        | 1.2           | 2.7        | 600                       | 18.5 | 12.9 | 0.70              | 1.35 | 23.1 | 13.8 | 600                       | 27.8         | 1.54         | 22.5       | 117.9        | 5.3        |
|            | 5.5        | 2.1           | 4.9        | 450                       | 18.1 | 15.7 | 0.86              | 1.26 | 22.4 | 14.4 | 450                       | 27.8         | 1.72         | 21.8       | 127.2        | 4.7        |
|            | 5.5        | 2.1           | 4.9        | 600                       | 18.9 | 13.8 | 0.69              | 1.30 | 23.0 | 14.6 | 600                       | 28.6         | 1.58         | 23.2       | 114.1        | 5.3        |
| 90         | 2.8        | 0.2           | 0.5        | 450                       | 16.5 | 14.7 | 0.89              | 1.46 | 21.5 | 11.3 | 450                       | 26.9         | 1.68         | 21.1       | 125.4        | 4.7        |
|            | 2.8        | 0.2           | 0.5        | 600                       | 17.2 | 12.3 | 0.71              | 1.51 | 22.4 | 11.4 | 600                       | 27.7         | 1.53         | 22.4       | 112.7        | 5.3        |
|            | 4.1        | 1.1           | 2.5        | 450                       | 17.2 | 15.1 | 0.88              | 1.38 | 21.9 | 12.5 | 450                       | 28.4         | 1.74         | 22.3       | 128.3        | 4.8        |
|            | 4.1        | 1.1           | 2.5        | 600                       | 17.9 | 12.6 | 0.70              | 1.42 | 22.8 | 12.6 | 600                       | 29.1         | 1.60         | 23.6       | 114.9        | 5.3        |
|            | 5.5        | 2.0           | 4.6        | 450                       | 17.5 | 15.3 | 0.87              | 1.33 | 22.1 | 13.1 | 450                       | 29.1         | 1.79         | 22.9       | 130.0        | 4.8        |
|            | 5.5        | 2.0           | 4.6        | 600                       | 18.3 | 12.8 | 0.70              | 1.38 | 23.0 | 13.2 | 600                       | 29.9         | 1.63         | 24.3       | 116.2        | 5.4        |
| 100        | 2.8        | 0.2           | 0.5        | 450                       | 15.2 | 14.0 | 0.92              | 1.64 | 20.8 | 9.3  | Operation Not Recommended |              |              |            |              |            |
|            | 2.8        | 0.2           | 0.5        | 600                       | 15.9 | 11.7 | 0.74              | 1.69 | 21.7 | 9.4  |                           |              |              |            |              |            |
|            | 4.1        | 1.1           | 2.5        | 450                       | 15.9 | 14.3 | 0.90              | 1.54 | 21.2 | 10.3 |                           |              |              |            |              |            |
|            | 4.1        | 1.1           | 2.5        | 600                       | 16.0 | 12.0 | 0.72              | 1.59 | 22.0 | 10.4 |                           |              |              |            |              |            |
|            | 5.5        | 1.9           | 4.4        | 450                       | 16.3 | 14.5 | 0.89              | 1.50 | 21.4 | 10.9 |                           |              |              |            |              |            |
|            | 5.5        | 1.9           | 4.4        | 600                       | 16.9 | 12.1 | 0.72              | 1.55 | 22.2 | 10.9 |                           |              |              |            |              |            |
| 110        | 2.8        | 0.1           | 0.2        | 450                       | 14.0 | 18.4 | 0.46              | 1.84 | 20.3 | 7.6  |                           |              |              |            |              |            |
|            | 2.8        | 0.1           | 0.2        | 600                       | 14.6 | 11.2 | 0.77              | 1.90 | 21.1 | 7.7  |                           |              |              |            |              |            |
|            | 4.1        | 0.9           | 2.1        | 450                       | 14.6 | 13.7 | 0.94              | 1.73 | 20.5 | 8.4  |                           |              |              |            |              |            |
|            | 4.1        | 0.9           | 2.1        | 600                       | 15.2 | 11.4 | 0.75              | 1.79 | 21.4 | 8.5  |                           |              |              |            |              |            |
|            | 5.5        | 1.7           | 3.9        | 450                       | 15.0 | 13.8 | 0.93              | 1.68 | 20.7 | 8.9  |                           |              |              |            |              |            |
|            | 5.5        | 1.7           | 3.9        | 600                       | 15.6 | 11.6 | 0.74              | 1.74 | 21.5 | 9.0  |                           |              |              |            |              |            |
| 120        | 2.8        | 0.1           | 0.2        | 450                       | 12.9 | 13.1 | 1.02              | 2.06 | 19.9 | 6.2  |                           |              |              |            |              |            |
|            | 2.8        | 0.1           | 0.2        | 600                       | 13.4 | 10.9 | 0.82              | 2.13 | 20.7 | 6.3  |                           |              |              |            |              |            |
|            | 4.1        | 0.8           | 1.8        | 450                       | 13.4 | 13.2 | 0.99              | 1.94 | 20.1 | 6.9  |                           |              |              |            |              |            |
|            | 4.1        | 0.8           | 1.8        | 600                       | 14.0 | 11.0 | 0.79              | 2.01 | 20.8 | 7.0  |                           |              |              |            |              |            |
|            | 5.5        | 1.6           | 3.7        | 450                       | 13.7 | 13.3 | 0.97              | 1.89 | 20.2 | 7.3  |                           |              |              |            |              |            |
|            | 5.5        | 1.6           | 3.7        | 600                       | 14.3 | 11.1 | 0.78              | 1.95 | 21.0 | 7.3  |                           |              |              |            |              |            |

#### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

#### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD024

## 850 CFM NOMINAL AIRFLOW COOLING/850 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|-----|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |     | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 8.0 | 5.6           | 12.9  | Operation Not Recommended |      |      |                   |      |      |      | 640                       | 16.3 | 1.80 | 10.6 | 94  | 2.66 |
|            | 8.0 | 5.6           | 12.9  |                           |      |      |                   |      |      |      | 850                       | 16.8 | 1.65 | 11.2 | 88  | 2.99 |
| 30         | 4.0 | 1.5           | 3.5   | 640                       | 27.9 | 15.6 | 0.56              | 0.94 | 31.1 | 29.8 | 640                       | 18.5 | 1.83 | 12.5 | 97  | 2.95 |
|            | 4.0 | 1.5           | 3.5   | 850                       | 29.1 | 18.7 | 0.64              | 0.97 | 32.4 | 30.0 | 850                       | 19.0 | 1.68 | 13.3 | 91  | 3.32 |
|            | 6.0 | 3.1           | 7.2   | 640                       | 28.0 | 15.6 | 0.56              | 0.90 | 31.1 | 31.1 | 640                       | 19.2 | 1.84 | 13.2 | 98  | 3.05 |
|            | 6.0 | 3.1           | 7.2   | 850                       | 29.2 | 18.7 | 0.64              | 0.93 | 32.4 | 31.3 | 850                       | 19.7 | 1.68 | 14.0 | 91  | 3.42 |
|            | 8.0 | 5.1           | 11.8  | 640                       | 28.1 | 15.7 | 0.56              | 0.88 | 31.1 | 31.8 | 640                       | 19.5 | 1.85 | 13.5 | 98  | 3.10 |
|            | 8.0 | 5.1           | 11.8  | 850                       | 29.3 | 18.8 | 0.64              | 0.91 | 32.4 | 32.1 | 850                       | 20.0 | 1.69 | 14.3 | 92  | 3.48 |
| 40         | 4.0 | 1.3           | 3.0   | 640                       | 27.8 | 15.8 | 0.57              | 1.04 | 31.3 | 26.9 | 640                       | 21.4 | 1.87 | 15.2 | 101 | 3.34 |
|            | 4.0 | 1.3           | 3.0   | 850                       | 29.0 | 18.9 | 0.65              | 1.07 | 32.6 | 27.1 | 850                       | 22.0 | 1.71 | 16.1 | 94  | 3.75 |
|            | 6.0 | 2.8           | 6.5   | 640                       | 28.0 | 15.8 | 0.56              | 0.99 | 31.4 | 28.5 | 640                       | 22.2 | 1.89 | 16.0 | 102 | 3.45 |
|            | 6.0 | 2.8           | 6.5   | 850                       | 29.2 | 18.9 | 0.65              | 1.02 | 32.6 | 28.7 | 850                       | 22.8 | 1.72 | 17.0 | 95  | 3.87 |
|            | 8.0 | 4.5           | 10.4  | 640                       | 28.2 | 15.8 | 0.56              | 0.96 | 31.4 | 29.3 | 640                       | 22.6 | 1.89 | 16.4 | 103 | 3.51 |
|            | 8.0 | 4.5           | 10.4  | 850                       | 29.3 | 18.9 | 0.65              | 0.99 | 32.7 | 29.5 | 850                       | 23.3 | 1.73 | 17.4 | 95  | 3.94 |
| 50         | 4.0 | 1.3           | 3.0   | 640                       | 27.6 | 15.9 | 0.58              | 1.15 | 31.5 | 24.1 | 640                       | 24.2 | 1.92 | 17.8 | 105 | 3.71 |
|            | 4.0 | 1.3           | 3.0   | 850                       | 28.7 | 19.0 | 0.66              | 1.18 | 32.7 | 24.3 | 850                       | 24.9 | 1.75 | 18.9 | 97  | 4.16 |
|            | 6.0 | 2.6           | 6.0   | 640                       | 27.8 | 15.9 | 0.57              | 1.08 | 31.5 | 25.7 | 640                       | 25.2 | 1.93 | 18.7 | 106 | 3.82 |
|            | 6.0 | 2.6           | 6.0   | 850                       | 29.0 | 19.1 | 0.66              | 1.12 | 32.8 | 25.9 | 850                       | 25.9 | 1.76 | 19.9 | 98  | 4.29 |
|            | 8.0 | 4.3           | 9.9   | 640                       | 27.9 | 15.9 | 0.57              | 1.06 | 31.5 | 26.5 | 640                       | 25.7 | 1.94 | 19.2 | 107 | 3.89 |
|            | 8.0 | 4.3           | 9.9   | 850                       | 29.1 | 19.1 | 0.66              | 1.09 | 32.8 | 26.7 | 850                       | 26.4 | 1.77 | 20.3 | 99  | 4.36 |
| 60         | 4.0 | 1.2           | 2.8   | 640                       | 26.9 | 15.9 | 0.59              | 1.27 | 31.2 | 21.1 | 640                       | 27.0 | 1.96 | 20.4 | 109 | 4.05 |
|            | 4.0 | 1.2           | 2.8   | 850                       | 28.0 | 19.1 | 0.68              | 1.32 | 32.5 | 21.3 | 850                       | 27.7 | 1.79 | 21.7 | 100 | 4.54 |
|            | 6.0 | 2.5           | 5.8   | 640                       | 27.3 | 15.9 | 0.58              | 1.20 | 31.4 | 22.7 | 640                       | 28.1 | 1.97 | 21.4 | 111 | 4.17 |
|            | 6.0 | 2.5           | 5.8   | 850                       | 28.4 | 19.1 | 0.67              | 1.24 | 32.6 | 22.9 | 850                       | 28.8 | 1.80 | 22.7 | 101 | 4.68 |
|            | 8.0 | 4.0           | 9.2   | 640                       | 27.5 | 15.9 | 0.58              | 1.17 | 31.4 | 23.5 | 640                       | 28.6 | 1.98 | 21.9 | 111 | 4.23 |
|            | 8.0 | 4.0           | 9.2   | 850                       | 28.6 | 19.1 | 0.67              | 1.21 | 32.7 | 23.7 | 850                       | 29.4 | 1.81 | 23.2 | 102 | 4.75 |
| 70         | 4.0 | 1.1           | 2.5   | 640                       | 26.0 | 15.8 | 0.61              | 1.42 | 30.8 | 18.2 | 640                       | 29.7 | 2.00 | 22.9 | 113 | 4.36 |
|            | 4.0 | 1.1           | 2.5   | 850                       | 27.0 | 18.9 | 0.70              | 1.47 | 32.0 | 18.4 | 850                       | 30.5 | 1.83 | 24.3 | 103 | 4.89 |
|            | 6.0 | 2.3           | 5.3   | 640                       | 26.5 | 15.9 | 0.60              | 1.34 | 31.1 | 19.8 | 640                       | 30.8 | 2.02 | 23.9 | 115 | 4.48 |
|            | 6.0 | 2.3           | 5.3   | 850                       | 27.6 | 19.0 | 0.69              | 1.39 | 32.3 | 19.9 | 850                       | 31.7 | 1.84 | 25.4 | 104 | 5.04 |
|            | 8.0 | 3.8           | 8.8   | 640                       | 26.7 | 15.9 | 0.60              | 1.30 | 31.2 | 20.5 | 640                       | 31.4 | 2.02 | 24.5 | 115 | 4.55 |
|            | 8.0 | 3.8           | 8.8   | 850                       | 27.8 | 19.0 | 0.68              | 1.35 | 32.4 | 20.7 | 850                       | 32.3 | 1.85 | 25.9 | 105 | 5.11 |
| 80         | 4.0 | 1.0           | 2.3   | 640                       | 24.8 | 15.6 | 0.63              | 1.59 | 30.2 | 15.6 | 640                       | 32.3 | 2.04 | 25.3 | 117 | 4.65 |
|            | 4.0 | 1.0           | 2.3   | 850                       | 25.8 | 18.6 | 0.72              | 1.65 | 31.5 | 15.7 | 850                       | 33.2 | 1.86 | 26.8 | 106 | 5.22 |
|            | 6.0 | 2.2           | 5.1   | 640                       | 25.4 | 15.7 | 0.62              | 1.50 | 30.6 | 16.9 | 640                       | 33.5 | 2.06 | 26.3 | 118 | 4.77 |
|            | 6.0 | 2.2           | 5.1   | 850                       | 26.5 | 18.8 | 0.71              | 1.55 | 31.8 | 17.1 | 850                       | 34.4 | 1.88 | 27.9 | 107 | 5.36 |
|            | 8.0 | 3.5           | 8.1   | 640                       | 25.7 | 15.8 | 0.61              | 1.46 | 30.7 | 17.7 | 640                       | 34.1 | 2.07 | 26.9 | 119 | 4.83 |
|            | 8.0 | 3.5           | 8.1   | 850                       | 26.8 | 18.9 | 0.70              | 1.51 | 31.9 | 17.8 | 850                       | 35.0 | 1.89 | 28.5 | 108 | 5.43 |
| 85         | 4.0 | 1.0           | 2.3   | 640                       | 24.1 | 15.4 | 0.64              | 1.69 | 29.9 | 14.3 | 640                       | 33.5 | 2.06 | 26.4 | 119 | 4.78 |
|            | 4.0 | 1.0           | 2.3   | 850                       | 25.1 | 18.4 | 0.73              | 1.75 | 31.1 | 14.4 | 850                       | 34.4 | 1.88 | 28.0 | 108 | 5.36 |
|            | 6.0 | 2.2           | 5.0   | 640                       | 24.8 | 15.5 | 0.63              | 1.59 | 30.2 | 15.6 | 640                       | 34.7 | 2.08 | 27.5 | 120 | 4.90 |
|            | 6.0 | 2.2           | 5.0   | 850                       | 25.8 | 18.6 | 0.72              | 1.65 | 31.5 | 15.7 | 850                       | 35.7 | 1.90 | 29.2 | 109 | 5.50 |
|            | 8.0 | 3.5           | 8.0   | 640                       | 25.1 | 15.6 | 0.62              | 1.55 | 30.4 | 16.2 | 640                       | 35.4 | 2.09 | 28.0 | 121 | 4.96 |
|            | 8.0 | 3.5           | 8.0   | 850                       | 26.2 | 18.7 | 0.71              | 1.60 | 31.6 | 16.4 | 850                       | 36.3 | 1.91 | 29.8 | 110 | 5.57 |
| 90         | 4.0 | 1.0           | 2.3   | 640                       | 23.5 | 15.2 | 0.65              | 1.79 | 29.6 | 13.1 | 640                       | 34.8 | 2.08 | 27.5 | 120 | 4.90 |
|            | 4.0 | 1.0           | 2.3   | 850                       | 24.4 | 18.2 | 0.74              | 1.85 | 30.8 | 13.2 | 850                       | 35.7 | 1.90 | 29.2 | 109 | 5.51 |
|            | 6.0 | 2.1           | 4.9   | 640                       | 24.2 | 15.4 | 0.64              | 1.69 | 29.9 | 14.3 | 640                       | 36.0 | 2.10 | 28.6 | 122 | 5.03 |
|            | 6.0 | 2.1           | 4.9   | 850                       | 25.2 | 18.4 | 0.73              | 1.74 | 31.1 | 14.4 | 850                       | 37.0 | 1.92 | 30.4 | 110 | 5.64 |
|            | 8.0 | 3.4           | 7.9   | 640                       | 24.5 | 15.5 | 0.63              | 1.64 | 30.1 | 15.0 | 640                       | 36.6 | 2.11 | 29.2 | 123 | 5.09 |
|            | 8.0 | 3.4           | 7.9   | 850                       | 25.5 | 18.5 | 0.73              | 1.69 | 31.3 | 15.1 | 850                       | 37.6 | 1.93 | 31.0 | 111 | 5.71 |
| 100        | 4.0 | 1.0           | 2.3   | 640                       | 21.9 | 14.7 | 0.67              | 2.02 | 28.8 | 10.9 | Operation Not Recommended |      |      |      |     |      |
|            | 4.0 | 1.0           | 2.3   | 850                       | 22.8 | 17.6 | 0.77              | 2.08 | 30.0 | 11.0 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 640                       | 22.7 | 14.9 | 0.66              | 1.90 | 29.2 | 12.0 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 850                       | 23.7 | 17.9 | 0.76              | 1.96 | 30.4 | 12.0 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 640                       | 23.1 | 15.1 | 0.65              | 1.84 | 29.4 | 12.5 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 850                       | 24.1 | 18.1 | 0.75              | 1.91 | 30.6 | 12.6 |                           |      |      |      |     |      |
| 110        | 4.0 | 0.9           | 2.1   | 640                       | 20.2 | 14.0 | 0.69              | 2.27 | 28.0 | 8.9  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 850                       | 21.1 | 16.8 | 0.80              | 2.34 | 29.1 | 9.0  |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 640                       | 21.1 | 14.4 | 0.68              | 2.14 | 28.4 | 9.8  |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 850                       | 22.0 | 17.2 | 0.78              | 2.21 | 29.5 | 9.9  |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 640                       | 21.5 | 14.5 | 0.67              | 2.08 | 28.6 | 10.3 |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 850                       | 22.4 | 17.4 | 0.78              | 2.15 | 29.7 | 10.4 |                           |      |      |      |     |      |
| 120        | 4.0 | 0.9           | 2.1   | 640                       | 18.4 | 13.2 | 0.72              | 2.55 | 27.1 | 7.2  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 850                       | 19.2 | 15.8 | 0.82              | 2.64 | 28.2 | 7.3  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 640                       | 19.3 | 13.6 | 0.70              | 2.41 | 27.5 | 8.0  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 850                       | 20.1 | 16.3 | 0.81              | 2.49 | 28.6 | 8.1  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 640                       | 19.7 | 13.8 | 0.70              | 2.35 | 27.8 | 8.4  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 850                       | 20.6 | 16.5 | 0.80              | 2.42 | 28.9 | 8.5  |                           |      |      |      |     |      |

### LEGEND

|       |   |   |
|-------|---|---|
| AHRI  | — | Air Conditioning, Heating and Refrigeration Institute |
| COP   | — | Coefficient of Performance                            |
| db    | — | Dry Bulb  |
| EER   | — | Energy Efficiency Ratio                               |
| EWT   | — | Entering Water Temperature                            |
| GPM   | — | Gallons Per Minute                                    |
| HE    | — | Heat of Extraction (MBtuh)                            |
| ISO   | — | International Organization for Standardization        |
| LAT   | — | Leaving Air Temperature (F)                           |
| MBtuh | — | Btuh in Thousands                                     |
| TC    | — | Total Capacity (MBtuh)                                |
| THC   | — | Total Heating Capacity (MBtuh)                        |
| THR   | — | Total Heat Rejection (MBtuh)                          |
| TSC   | — | Total Sensible Capacity (MBtuh)                       |
| wb    | — | Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD030

### 950 CFM NOMINAL AIRFLOW COOLING/950 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|-----|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |     | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 8.0 | 5.6           | 12.9  | Operation Not Recommended |      |      |                   |      |      |      | 715                       | 19.9 | 2.10 | 13.1 | 96  | 2.78 |
|            | 8.0 | 5.6           | 12.9  |                           |      |      |                   |      |      |      | 950                       | 20.4 | 1.92 | 13.9 | 90  | 3.12 |
| 30         | 4.0 | 1.5           | 3.5   | 715                       | 28.8 | 16.3 | 0.57              | 1.18 | 32.8 | 24.4 | 715                       | 21.7 | 2.13 | 14.8 | 98  | 2.99 |
|            | 4.0 | 1.5           | 3.5   | 950                       | 30.0 | 19.5 | 0.65              | 1.22 | 34.1 | 24.6 | 950                       | 22.3 | 1.95 | 15.7 | 92  | 3.36 |
|            | 6.0 | 3.1           | 7.2   | 715                       | 28.9 | 16.3 | 0.57              | 1.14 | 32.8 | 25.3 | 715                       | 22.5 | 2.14 | 15.6 | 99  | 3.08 |
|            | 6.0 | 3.1           | 7.2   | 950                       | 30.1 | 19.6 | 0.65              | 1.18 | 34.1 | 25.5 | 950                       | 23.1 | 1.96 | 16.5 | 93  | 3.46 |
|            | 8.0 | 5.1           | 11.8  | 715                       | 29.0 | 16.4 | 0.56              | 1.11 | 32.8 | 26.0 | 715                       | 23.0 | 2.15 | 16.0 | 100 | 3.13 |
|            | 8.0 | 5.1           | 11.8  | 950                       | 30.2 | 19.6 | 0.65              | 1.15 | 34.1 | 26.2 | 950                       | 23.6 | 1.97 | 16.9 | 93  | 3.52 |
| 40         | 4.0 | 1.3           | 3.0   | 715                       | 31.0 | 17.8 | 0.57              | 1.30 | 35.5 | 23.9 | 715                       | 24.7 | 2.18 | 17.5 | 102 | 3.32 |
|            | 4.0 | 1.3           | 3.0   | 950                       | 32.3 | 21.3 | 0.66              | 1.34 | 36.9 | 24.1 | 950                       | 25.3 | 1.99 | 18.6 | 95  | 3.72 |
|            | 6.0 | 2.8           | 6.5   | 715                       | 31.2 | 17.8 | 0.57              | 1.25 | 35.5 | 24.9 | 715                       | 25.6 | 2.20 | 18.4 | 103 | 3.42 |
|            | 6.0 | 2.8           | 6.5   | 950                       | 32.5 | 21.3 | 0.66              | 1.30 | 36.9 | 25.1 | 950                       | 26.3 | 2.01 | 19.5 | 96  | 3.84 |
|            | 8.0 | 4.5           | 10.4  | 715                       | 31.4 | 17.8 | 0.57              | 1.22 | 35.5 | 25.7 | 715                       | 26.2 | 2.21 | 18.9 | 104 | 3.47 |
|            | 8.0 | 4.5           | 10.4  | 950                       | 32.7 | 21.4 | 0.65              | 1.26 | 36.9 | 25.9 | 950                       | 26.9 | 2.02 | 20.0 | 96  | 3.90 |
| 50         | 4.0 | 1.3           | 3.0   | 715                       | 31.9 | 18.5 | 0.58              | 1.44 | 36.8 | 22.2 | 715                       | 27.7 | 2.24 | 20.2 | 106 | 3.62 |
|            | 4.0 | 1.3           | 3.0   | 950                       | 33.2 | 22.2 | 0.67              | 1.49 | 38.3 | 22.4 | 950                       | 28.4 | 2.05 | 21.4 | 98  | 4.07 |
|            | 6.0 | 2.6           | 6.0   | 715                       | 32.2 | 18.5 | 0.58              | 1.37 | 36.8 | 23.4 | 715                       | 28.8 | 2.26 | 21.2 | 107 | 3.74 |
|            | 6.0 | 2.6           | 6.0   | 950                       | 33.5 | 22.2 | 0.66              | 1.42 | 38.3 | 23.6 | 950                       | 29.6 | 2.07 | 22.5 | 99  | 4.19 |
|            | 8.0 | 4.3           | 9.9   | 715                       | 32.3 | 18.5 | 0.57              | 1.34 | 36.9 | 24.2 | 715                       | 29.4 | 2.27 | 21.8 | 108 | 3.79 |
|            | 8.0 | 4.3           | 9.9   | 950                       | 33.7 | 22.2 | 0.66              | 1.38 | 38.3 | 24.4 | 950                       | 30.2 | 2.08 | 23.1 | 99  | 4.26 |
| 60         | 4.0 | 1.2           | 2.8   | 715                       | 31.0 | 18.2 | 0.59              | 1.60 | 36.4 | 19.4 | 715                       | 30.6 | 2.30 | 22.9 | 110 | 3.91 |
|            | 4.0 | 1.2           | 2.8   | 950                       | 32.3 | 21.8 | 0.68              | 1.65 | 37.9 | 19.6 | 950                       | 31.5 | 2.10 | 24.3 | 101 | 4.39 |
|            | 6.0 | 2.5           | 5.8   | 715                       | 31.7 | 18.5 | 0.58              | 1.51 | 36.8 | 21.1 | 715                       | 31.9 | 2.32 | 24.1 | 111 | 4.03 |
|            | 6.0 | 2.5           | 5.8   | 950                       | 33.0 | 22.1 | 0.67              | 1.56 | 38.3 | 21.2 | 950                       | 32.8 | 2.12 | 25.6 | 102 | 4.53 |
|            | 8.0 | 4.0           | 9.2   | 715                       | 32.0 | 18.5 | 0.58              | 1.46 | 36.9 | 21.9 | 715                       | 32.6 | 2.34 | 24.7 | 112 | 4.09 |
|            | 8.0 | 4.0           | 9.2   | 950                       | 33.3 | 22.2 | 0.67              | 1.51 | 38.4 | 22.0 | 950                       | 33.5 | 2.14 | 26.2 | 103 | 4.60 |
| 70         | 4.0 | 1.1           | 2.5   | 715                       | 29.5 | 17.6 | 0.60              | 1.76 | 35.5 | 16.8 | 715                       | 33.6 | 2.36 | 25.6 | 114 | 4.18 |
|            | 4.0 | 1.1           | 2.5   | 950                       | 30.7 | 21.1 | 0.69              | 1.81 | 36.9 | 16.9 | 950                       | 34.5 | 2.16 | 27.2 | 104 | 4.69 |
|            | 6.0 | 2.3           | 5.3   | 715                       | 30.5 | 18.0 | 0.59              | 1.65 | 36.1 | 18.4 | 715                       | 35.1 | 2.39 | 26.9 | 115 | 4.30 |
|            | 6.0 | 2.3           | 5.3   | 950                       | 31.7 | 21.6 | 0.68              | 1.71 | 37.5 | 18.5 | 950                       | 36.0 | 2.18 | 28.5 | 105 | 4.83 |
|            | 8.0 | 3.8           | 8.8   | 715                       | 30.9 | 18.2 | 0.59              | 1.61 | 36.4 | 19.2 | 715                       | 35.8 | 2.40 | 27.6 | 116 | 4.36 |
|            | 8.0 | 3.8           | 8.8   | 950                       | 32.2 | 21.8 | 0.68              | 1.66 | 37.8 | 19.4 | 950                       | 36.8 | 2.20 | 29.3 | 106 | 4.90 |
| 80         | 4.0 | 1.0           | 2.3   | 715                       | 27.7 | 16.8 | 0.61              | 1.94 | 34.3 | 14.3 | 715                       | 36.6 | 2.42 | 28.3 | 117 | 4.43 |
|            | 4.0 | 1.0           | 2.3   | 950                       | 28.8 | 20.2 | 0.70              | 2.00 | 35.6 | 14.4 | 950                       | 37.5 | 2.21 | 30.0 | 107 | 4.97 |
|            | 6.0 | 2.2           | 5.1   | 715                       | 28.8 | 17.3 | 0.60              | 1.83 | 35.0 | 15.8 | 715                       | 38.1 | 2.46 | 29.6 | 119 | 4.55 |
|            | 6.0 | 2.2           | 5.1   | 950                       | 30.0 | 20.7 | 0.69              | 1.89 | 36.4 | 15.9 | 950                       | 39.1 | 2.25 | 31.4 | 108 | 5.11 |
|            | 8.0 | 3.5           | 8.1   | 715                       | 29.3 | 17.5 | 0.60              | 1.77 | 35.4 | 16.6 | 715                       | 38.9 | 2.47 | 30.4 | 120 | 4.61 |
|            | 8.0 | 3.5           | 8.1   | 950                       | 30.5 | 21.0 | 0.69              | 1.83 | 36.8 | 16.7 | 950                       | 40.0 | 2.26 | 32.2 | 109 | 5.18 |
| 85         | 4.0 | 1.0           | 2.3   | 715                       | 26.7 | 16.4 | 0.62              | 2.04 | 33.7 | 13.1 | 715                       | 38.0 | 2.45 | 29.5 | 119 | 4.54 |
|            | 4.0 | 1.0           | 2.3   | 950                       | 27.8 | 19.7 | 0.71              | 2.11 | 35.0 | 13.2 | 950                       | 39.0 | 2.24 | 31.4 | 108 | 5.10 |
|            | 6.0 | 2.2           | 5.0   | 715                       | 27.8 | 16.9 | 0.61              | 1.92 | 34.4 | 14.5 | 715                       | 39.6 | 2.49 | 31.0 | 121 | 4.66 |
|            | 6.0 | 2.2           | 5.0   | 950                       | 29.0 | 20.2 | 0.70              | 1.99 | 35.8 | 14.6 | 950                       | 40.6 | 2.28 | 32.8 | 110 | 5.23 |
|            | 8.0 | 3.5           | 8.0   | 715                       | 28.4 | 17.1 | 0.60              | 1.87 | 34.7 | 15.2 | 715                       | 40.4 | 2.51 | 31.7 | 122 | 4.72 |
|            | 8.0 | 3.5           | 8.0   | 950                       | 29.6 | 20.5 | 0.69              | 1.93 | 36.1 | 15.3 | 950                       | 41.5 | 2.30 | 33.6 | 110 | 5.30 |
| 90         | 4.0 | 1.0           | 2.3   | 715                       | 25.7 | 16.0 | 0.62              | 2.15 | 33.1 | 12.0 | 715                       | 39.4 | 2.49 | 30.8 | 121 | 4.65 |
|            | 4.0 | 1.0           | 2.3   | 950                       | 26.8 | 19.2 | 0.72              | 2.22 | 34.4 | 12.1 | 950                       | 40.5 | 2.27 | 32.7 | 109 | 5.22 |
|            | 6.0 | 2.1           | 4.9   | 715                       | 26.9 | 16.5 | 0.61              | 2.02 | 33.8 | 13.3 | 715                       | 41.1 | 2.53 | 32.3 | 123 | 4.77 |
|            | 6.0 | 2.1           | 4.9   | 950                       | 28.0 | 19.7 | 0.71              | 2.09 | 35.1 | 13.4 | 950                       | 42.2 | 2.31 | 34.3 | 111 | 5.35 |
|            | 8.0 | 3.4           | 7.9   | 715                       | 27.4 | 16.7 | 0.61              | 1.96 | 34.1 | 14.0 | 715                       | 41.9 | 2.55 | 33.0 | 124 | 4.82 |
|            | 8.0 | 3.4           | 7.9   | 950                       | 28.6 | 20.0 | 0.70              | 2.03 | 35.5 | 14.1 | 950                       | 43.0 | 2.33 | 35.1 | 112 | 5.42 |
| 100        | 4.0 | 1.0           | 2.3   | 715                       | 23.9 | 15.3 | 0.64              | 2.39 | 32.1 | 10.0 | Operation Not Recommended |      |      |      |     |      |
|            | 4.0 | 1.0           | 2.3   | 950                       | 24.9 | 18.3 | 0.73              | 2.47 | 33.4 | 10.1 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 715                       | 24.9 | 15.7 | 0.63              | 2.25 | 32.6 | 11.1 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 950                       | 26.0 | 18.8 | 0.72              | 2.32 | 33.9 | 11.2 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 715                       | 25.5 | 15.9 | 0.62              | 2.18 | 32.9 | 11.7 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 950                       | 26.5 | 19.0 | 0.72              | 2.25 | 34.2 | 11.8 |                           |      |      |      |     |      |
| 110        | 4.0 | 0.9           | 2.1   | 715                       | 22.4 | 14.7 | 0.66              | 2.68 | 31.5 | 8.4  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 950                       | 23.3 | 17.6 | 0.76              | 2.77 | 32.8 | 8.4  |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 715                       | 23.2 | 15.0 | 0.65              | 2.51 | 31.7 | 9.2  |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 950                       | 24.1 | 17.9 | 0.74              | 2.60 | 33.0 | 9.3  |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 715                       | 23.6 | 15.2 | 0.64              | 2.44 | 31.9 | 9.7  |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 950                       | 24.6 | 18.1 | 0.74              | 2.52 | 33.2 | 9.8  |                           |      |      |      |     |      |
| 120        | 4.0 | 0.9           | 2.1   | 715                       | 21.3 | 14.6 | 0.68              | 3.02 | 31.6 | 7.1  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 950                       | 22.2 | 17.4 | 0.79              | 3.12 | 32.9 | 7.1  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 715                       | 21.8 | 14.6 | 0.67              | 2.82 | 31.5 | 7.7  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 950                       | 22.7 | 17.5 | 0.77              | 2.92 | 32.7 | 7.8  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 715                       | 22.1 | 14.7 | 0.66              | 2.74 | 31.5 | 8.1  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 950                       | 23.0 | 17.6 | 0.76              | 2.83 | 32.7 | 8.1  |                           |      |      |      |     |      |

#### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
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| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

#### NOTES:

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- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
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- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD036

## 1,250 CFM NOMINAL AIRFLOW COOLING/1,250 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|-----|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |     | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 9.0 | 5.9           | 13.6  | Operation Not Recommended |      |      |                   |      |      |      | 940                       | 21.7 | 2.41 | 14.0 | 91  | 2.64 |
|            | 9.0 | 5.9           | 13.6  |                           |      |      |                   |      |      |      | 1250                      | 22.3 | 2.21 | 14.9 | 87  | 2.96 |
| 30         | 4.5 | 1.7           | 3.9   | 940                       | 32.8 | 18.6 | 0.57              | 1.49 | 37.9 | 22.0 | 940                       | 24.0 | 2.44 | 16.1 | 94  | 2.88 |
|            | 4.5 | 1.7           | 3.9   | 1250                      | 34.1 | 22.3 | 0.65              | 1.54 | 39.4 | 22.2 | 1250                      | 24.6 | 2.23 | 17.1 | 88  | 3.23 |
|            | 6.8 | 3.3           | 7.6   | 940                       | 33.1 | 18.6 | 0.56              | 1.43 | 38.0 | 23.2 | 940                       | 24.9 | 2.45 | 16.9 | 94  | 2.97 |
|            | 6.8 | 3.3           | 7.6   | 1250                      | 34.5 | 22.3 | 0.65              | 1.48 | 39.5 | 23.4 | 1250                      | 25.5 | 2.24 | 18.0 | 89  | 3.34 |
|            | 9.0 | 5.7           | 13.2  | 940                       | 33.3 | 18.7 | 0.56              | 1.40 | 38.1 | 23.8 | 940                       | 25.4 | 2.46 | 17.4 | 95  | 3.02 |
|            | 9.0 | 5.7           | 13.2  | 1250                      | 34.7 | 22.4 | 0.65              | 1.45 | 39.6 | 24.0 | 1250                      | 26.0 | 2.25 | 18.4 | 89  | 3.40 |
| 40         | 4.5 | 1.5           | 3.5   | 940                       | 35.5 | 21.0 | 0.59              | 1.57 | 40.8 | 22.6 | 940                       | 27.3 | 2.48 | 19.2 | 97  | 3.23 |
|            | 4.5 | 1.5           | 3.5   | 1250                      | 36.9 | 25.1 | 0.68              | 1.62 | 42.4 | 22.8 | 1250                      | 28.1 | 2.27 | 20.4 | 91  | 3.62 |
|            | 6.8 | 3.2           | 7.4   | 940                       | 35.6 | 21.0 | 0.59              | 1.54 | 40.9 | 23.1 | 940                       | 28.4 | 2.50 | 20.2 | 98  | 3.33 |
|            | 6.8 | 3.2           | 7.4   | 1250                      | 37.1 | 25.2 | 0.68              | 1.60 | 42.5 | 23.3 | 1250                      | 29.2 | 2.29 | 21.5 | 92  | 3.74 |
|            | 9.0 | 5.4           | 12.5  | 940                       | 35.9 | 21.3 | 0.59              | 1.51 | 41.1 | 23.8 | 940                       | 29.0 | 2.51 | 20.8 | 99  | 3.39 |
|            | 9.0 | 5.4           | 12.5  | 1250                      | 37.4 | 25.5 | 0.68              | 1.56 | 42.7 | 24.0 | 1250                      | 29.8 | 2.29 | 22.0 | 92  | 3.81 |
| 50         | 4.5 | 1.3           | 3.0   | 940                       | 35.9 | 21.7 | 0.60              | 1.75 | 41.8 | 20.5 | 940                       | 30.8 | 2.53 | 22.4 | 100 | 3.56 |
|            | 4.5 | 1.3           | 3.0   | 1250                      | 37.3 | 26.0 | 0.70              | 1.81 | 43.5 | 20.6 | 1250                      | 31.6 | 2.32 | 23.7 | 93  | 4.00 |
|            | 6.8 | 3.1           | 7.2   | 940                       | 36.2 | 21.8 | 0.60              | 1.67 | 41.9 | 21.7 | 940                       | 32.1 | 2.56 | 23.6 | 102 | 3.68 |
|            | 6.8 | 3.1           | 7.2   | 1250                      | 37.7 | 26.1 | 0.69              | 1.72 | 43.5 | 21.9 | 1250                      | 33.0 | 2.34 | 25.0 | 94  | 4.13 |
|            | 9.0 | 5.2           | 12.0  | 940                       | 36.9 | 22.1 | 0.60              | 1.63 | 42.5 | 22.7 | 940                       | 32.8 | 2.57 | 24.2 | 102 | 3.75 |
|            | 9.0 | 5.2           | 12.0  | 1250                      | 38.5 | 26.4 | 0.69              | 1.68 | 44.2 | 22.8 | 1250                      | 33.7 | 2.35 | 25.7 | 95  | 4.21 |
| 60         | 4.5 | 1.2           | 2.8   | 940                       | 34.6 | 21.6 | 0.63              | 1.90 | 41.1 | 18.2 | 940                       | 34.3 | 2.59 | 25.6 | 104 | 3.88 |
|            | 4.5 | 1.2           | 2.8   | 1250                      | 36.0 | 25.9 | 0.72              | 1.96 | 42.7 | 18.4 | 1250                      | 35.2 | 2.37 | 27.2 | 96  | 4.36 |
|            | 6.8 | 2.9           | 6.7   | 940                       | 35.5 | 21.9 | 0.62              | 1.80 | 41.6 | 19.7 | 940                       | 35.8 | 2.62 | 27.0 | 105 | 4.01 |
|            | 6.8 | 2.9           | 6.7   | 1250                      | 37.0 | 26.2 | 0.71              | 1.86 | 43.3 | 19.8 | 1250                      | 36.8 | 2.39 | 28.6 | 97  | 4.51 |
|            | 9.0 | 5.0           | 11.6  | 940                       | 35.8 | 21.9 | 0.61              | 1.76 | 41.8 | 20.4 | 940                       | 36.7 | 2.63 | 27.8 | 106 | 4.09 |
|            | 9.0 | 5.0           | 11.6  | 1250                      | 37.3 | 26.3 | 0.70              | 1.82 | 43.5 | 20.5 | 1250                      | 37.6 | 2.40 | 29.5 | 98  | 4.59 |
| 70         | 4.5 | 1.1           | 2.5   | 940                       | 32.8 | 21.0 | 0.64              | 2.06 | 39.9 | 15.9 | 940                       | 37.9 | 2.65 | 28.9 | 107 | 4.19 |
|            | 4.5 | 1.1           | 2.5   | 1250                      | 34.2 | 25.1 | 0.73              | 2.13 | 41.4 | 16.0 | 1250                      | 38.9 | 2.42 | 30.6 | 99  | 4.70 |
|            | 6.8 | 2.9           | 6.7   | 940                       | 34.0 | 21.4 | 0.63              | 1.96 | 40.7 | 17.4 | 940                       | 39.7 | 2.68 | 30.5 | 109 | 4.33 |
|            | 6.8 | 2.9           | 6.7   | 1250                      | 35.4 | 25.6 | 0.72              | 2.02 | 42.3 | 17.5 | 1250                      | 40.7 | 2.45 | 32.3 | 100 | 4.87 |
|            | 9.0 | 4.8           | 11.1  | 940                       | 34.5 | 21.6 | 0.63              | 1.91 | 41.0 | 18.1 | 940                       | 40.6 | 2.70 | 31.4 | 110 | 4.41 |
|            | 9.0 | 4.8           | 11.1  | 1250                      | 35.9 | 25.9 | 0.72              | 1.97 | 42.7 | 18.2 | 1250                      | 41.7 | 2.47 | 33.3 | 101 | 4.95 |
| 80         | 4.5 | 1.0           | 2.3   | 940                       | 30.8 | 20.2 | 0.65              | 2.25 | 38.5 | 13.7 | 940                       | 41.6 | 2.72 | 32.2 | 111 | 4.48 |
|            | 4.5 | 1.0           | 2.3   | 1250                      | 32.1 | 24.1 | 0.75              | 2.32 | 40.0 | 13.8 | 1250                      | 42.7 | 2.48 | 34.2 | 102 | 5.04 |
|            | 6.8 | 2.8           | 6.5   | 940                       | 32.0 | 20.6 | 0.64              | 2.13 | 39.3 | 15.0 | 940                       | 43.6 | 2.75 | 34.1 | 113 | 4.64 |
|            | 6.8 | 2.8           | 6.5   | 1250                      | 33.4 | 24.7 | 0.74              | 2.21 | 40.9 | 15.1 | 1250                      | 44.8 | 2.52 | 36.1 | 103 | 5.21 |
|            | 9.0 | 4.5           | 10.4  | 940                       | 32.6 | 20.9 | 0.64              | 2.08 | 39.7 | 15.7 | 940                       | 44.7 | 2.77 | 35.1 | 114 | 4.72 |
|            | 9.0 | 4.5           | 10.4  | 1250                      | 34.0 | 25.0 | 0.74              | 2.15 | 41.3 | 15.8 | 1250                      | 45.9 | 2.54 | 37.2 | 104 | 5.30 |
| 85         | 4.5 | 1.0           | 2.2   | 940                       | 29.8 | 19.8 | 0.66              | 2.36 | 37.9 | 12.7 | 940                       | 43.4 | 2.75 | 33.9 | 113 | 4.63 |
|            | 4.5 | 1.0           | 2.2   | 1250                      | 31.1 | 23.7 | 0.76              | 2.44 | 39.4 | 12.8 | 1250                      | 44.6 | 2.52 | 36.0 | 103 | 5.20 |
|            | 6.8 | 2.7           | 6.2   | 940                       | 31.0 | 20.2 | 0.65              | 2.24 | 38.6 | 13.9 | 940                       | 45.6 | 2.79 | 35.9 | 115 | 4.79 |
|            | 6.8 | 2.7           | 6.2   | 1250                      | 32.3 | 24.2 | 0.75              | 2.31 | 40.2 | 14.0 | 1250                      | 46.8 | 2.55 | 38.1 | 105 | 5.38 |
|            | 9.0 | 4.5           | 10.3  | 940                       | 31.6 | 20.5 | 0.65              | 2.18 | 39.0 | 14.5 | 940                       | 46.8 | 2.82 | 37.0 | 116 | 4.87 |
|            | 9.0 | 4.5           | 10.3  | 1250                      | 32.9 | 24.5 | 0.74              | 2.25 | 40.6 | 14.6 | 1250                      | 48.1 | 2.57 | 39.2 | 106 | 5.47 |
| 90         | 4.5 | 0.9           | 2.1   | 940                       | 28.9 | 19.4 | 0.67              | 2.47 | 37.3 | 11.7 | 940                       | 45.3 | 2.79 | 35.6 | 115 | 4.77 |
|            | 4.5 | 0.9           | 2.1   | 1250                      | 30.1 | 23.3 | 0.77              | 2.55 | 38.8 | 11.8 | 1250                      | 46.5 | 2.55 | 37.8 | 104 | 5.35 |
|            | 6.8 | 2.6           | 6.0   | 940                       | 30.0 | 19.8 | 0.66              | 2.34 | 38.0 | 12.8 | 940                       | 47.6 | 2.83 | 37.7 | 117 | 4.93 |
|            | 6.8 | 2.6           | 6.0   | 1250                      | 31.2 | 23.7 | 0.76              | 2.42 | 39.5 | 12.9 | 1250                      | 48.9 | 2.59 | 40.0 | 106 | 5.54 |
|            | 9.0 | 4.4           | 10.2  | 940                       | 30.6 | 20.1 | 0.66              | 2.27 | 38.3 | 13.4 | 940                       | 48.9 | 2.86 | 38.9 | 118 | 5.02 |
|            | 9.0 | 4.4           | 10.2  | 1250                      | 31.8 | 24.0 | 0.75              | 2.35 | 39.9 | 13.5 | 1250                      | 50.2 | 2.61 | 41.3 | 107 | 5.64 |
| 100        | 4.5 | 0.8           | 1.8   | 940                       | 27.3 | 19.0 | 0.70              | 2.72 | 36.6 | 10.0 | Operation Not Recommended |      |      |      |     |      |
|            | 4.5 | 0.8           | 1.8   | 1250                      | 28.5 | 22.8 | 0.80              | 2.81 | 38.1 | 10.1 |                           |      |      |      |     |      |
|            | 6.8 | 2.6           | 6.0   | 940                       | 28.1 | 19.2 | 0.68              | 2.57 | 36.9 | 10.9 |                           |      |      |      |     |      |
|            | 6.8 | 2.6           | 6.0   | 1250                      | 29.3 | 23.0 | 0.78              | 2.66 | 38.4 | 11.0 |                           |      |      |      |     |      |
|            | 9.0 | 4.2           | 9.7   | 940                       | 28.6 | 19.3 | 0.68              | 2.50 | 37.2 | 11.4 |                           |      |      |      |     |      |
|            | 9.0 | 4.2           | 9.7   | 1250                      | 29.8 | 23.2 | 0.78              | 2.59 | 38.6 | 11.5 |                           |      |      |      |     |      |
| 110        | 4.5 | 0.8           | 1.8   | 940                       | 26.4 | 18.9 | 0.71              | 2.99 | 36.6 | 8.8  |                           |      |      |      |     |      |
|            | 4.5 | 0.8           | 1.8   | 1250                      | 27.5 | 22.6 | 0.82              | 3.09 | 38.1 | 8.9  |                           |      |      |      |     |      |
|            | 6.8 | 2.5           | 5.8   | 940                       | 26.9 | 19.0 | 0.71              | 2.85 | 36.6 | 9.4  |                           |      |      |      |     |      |
|            | 6.8 | 2.5           | 5.8   | 1250                      | 28.0 | 22.8 | 0.81              | 2.95 | 38.1 | 9.5  |                           |      |      |      |     |      |
|            | 9.0 | 4.0           | 9.2   | 940                       | 27.2 | 19.1 | 0.70              | 2.77 | 36.7 | 9.8  |                           |      |      |      |     |      |
|            | 9.0 | 4.0           | 9.2   | 1250                      | 28.3 | 22.8 | 0.81              | 2.86 | 38.1 | 9.9  |                           |      |      |      |     |      |
| 120        | 4.5 | 0.7           | 1.6   | 940                       | 25.8 | 19.3 | 0.75              | 3.33 | 37.2 | 7.7  |                           |      |      |      |     |      |
|            | 4.5 | 0.7           | 1.6   | 1250                      | 26.9 | 23.1 | 0.86              | 3.44 | 38.7 | 7.8  |                           |      |      |      |     |      |
|            | 6.8 | 2.5           | 5.8   | 940                       | 26.4 | 19.6 | 0.74              | 3.18 | 37.2 | 8.3  |                           |      |      |      |     |      |
|            | 6.8 | 2.5           | 5.8   | 1250                      | 27.5 | 23.5 | 0.86              | 3.29 | 38.7 | 8.4  |                           |      |      |      |     |      |
|            | 9.0 | 3.8           | 8.8   | 940                       | 26.9 | 19.7 | 0.73              | 3.09 | 37.4 | 8.7  |                           |      |      |      |     |      |
|            | 9.0 | 3.8           | 8.8   | 1250                      | 28.0 | 23.6 | 0.84              | 3.19 | 38.9 | 8.8  |                           |      |      |      |     |      |

### LEGEND

|       |   |   |
|-------|---|---|
| AHRI  | — | Air Conditioning, Heating and Refrigeration Institute |
| COP   | — | Coefficient of Performance                            |
| db    | — | Dry Bulb  |
| EER   | — | Energy Efficiency Ratio                               |
| EWT   | — | Entering Water Temperature                            |
| GPM   | — | Gallons Per Minute                                    |
| HE    | — | Heat of Extraction (MBtuh)                            |
| ISO   | — | International Organization for Standardization        |
| LAT   | — | Leaving Air Temperature (F)                           |
| MBtuh | — | Btuh in Thousands                                     |
| TC    | — | Total Capacity (MBtuh)                                |
| THC   | — | Total Heating Capacity (MBtuh)                        |
| THR   | — | Total Heat Rejection (MBtuh)                          |
| TSC   | — | Total Sensible Capacity (MBtuh)                       |
| wb    | — | Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD042

### 1,400 CFM NOMINAL AIRFLOW COOLING/1,400 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM          | PRESSURE DROP |            | COOLING                   |      |      |                   |      |      |      | HEATING                   |              |              |              |          |              |
|------------|--------------|---------------|------------|---------------------------|------|------|-------------------|------|------|------|---------------------------|--------------|--------------|--------------|----------|--------------|
|            |              | PSI           | ft wg      | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC          | kW           | HE           | LAT      | COP          |
| 20         | 11.0<br>11.0 | 4.0<br>4.0    | 9.2<br>9.2 | Operation Not Recommended |      |      |                   |      |      |      | 1050<br>1400              | 27.1<br>27.8 | 2.94<br>2.69 | 17.7<br>18.8 | 94<br>88 | 2.70<br>3.03 |
| 30         | 5.5          | 1.1           | 2.5        | 1050                      | 38.8 | 23.0 | 0.59              | 1.53 | 44.0 | 25.4 | 1050                      | 29.6         | 2.96         | 20.0         | 96       | 2.93         |
|            | 5.5          | 1.1           | 2.5        | 1400                      | 40.4 | 27.6 | 0.68              | 1.58 | 45.7 | 25.6 | 1400                      | 30.4         | 2.71         | 21.2         | 90       | 3.28         |
|            | 8.3          | 2.2           | 5.1        | 1050                      | 39.4 | 23.0 | 0.58              | 1.51 | 44.5 | 26.1 | 1050                      | 30.7         | 2.97         | 21.0         | 97       | 3.02         |
|            | 8.3          | 2.2           | 5.1        | 1400                      | 41.0 | 27.6 | 0.67              | 1.56 | 46.3 | 26.3 | 1400                      | 31.5         | 2.72         | 22.3         | 91       | 3.40         |
|            | 11.0         | 3.9           | 9.0        | 1050                      | 39.8 | 23.1 | 0.58              | 1.46 | 44.8 | 27.4 | 1050                      | 31.3         | 2.98         | 21.6         | 98       | 3.08         |
| 40         | 11.0         | 3.9           | 9.0        | 1400                      | 41.5 | 27.6 | 0.67              | 1.50 | 46.6 | 27.6 | 1400                      | 32.1         | 2.73         | 22.9         | 91       | 3.46         |
|            | 5.5          | 1.0           | 2.3        | 1050                      | 42.0 | 25.7 | 0.61              | 1.77 | 48.1 | 23.8 | 1050                      | 33.8         | 3.01         | 23.9         | 100      | 3.29         |
|            | 5.5          | 1.0           | 2.3        | 1400                      | 43.8 | 30.8 | 0.70              | 1.83 | 50.0 | 24.0 | 1400                      | 34.7         | 2.75         | 25.4         | 93       | 3.69         |
|            | 8.3          | 2.1           | 4.9        | 1050                      | 42.5 | 25.7 | 0.60              | 1.70 | 48.3 | 25.0 | 1050                      | 35.2         | 3.03         | 25.3         | 101      | 3.41         |
|            | 8.3          | 2.1           | 4.9        | 1400                      | 44.3 | 30.7 | 0.69              | 1.76 | 50.3 | 25.2 | 1400                      | 36.2         | 2.77         | 26.8         | 94       | 3.83         |
| 50         | 11.0         | 3.7           | 8.5        | 1050                      | 43.3 | 25.9 | 0.60              | 1.66 | 48.9 | 26.1 | 1050                      | 36.0         | 3.04         | 26.0         | 102      | 3.48         |
|            | 11.0         | 3.7           | 8.5        | 1400                      | 45.1 | 31.0 | 0.69              | 1.72 | 50.9 | 26.3 | 1400                      | 37.0         | 2.78         | 27.6         | 94       | 3.90         |
|            | 5.5          | 0.9           | 2.1        | 1050                      | 42.5 | 26.6 | 0.63              | 1.99 | 49.3 | 21.3 | 1050                      | 38.3         | 3.07         | 28.1         | 104      | 3.66         |
|            | 5.5          | 0.9           | 2.1        | 1400                      | 44.3 | 31.9 | 0.72              | 2.06 | 51.2 | 21.5 | 1400                      | 39.3         | 2.81         | 29.8         | 96       | 4.10         |
|            | 8.3          | 2.1           | 4.9        | 1050                      | 43.1 | 26.6 | 0.62              | 1.88 | 49.5 | 22.9 | 1050                      | 40.1         | 3.10         | 29.7         | 105      | 3.79         |
| 60         | 8.3          | 2.1           | 4.9        | 1400                      | 44.8 | 31.9 | 0.71              | 1.94 | 51.4 | 23.1 | 1400                      | 41.2         | 2.83         | 31.5         | 97       | 4.26         |
|            | 11.0         | 3.6           | 8.3        | 1050                      | 43.6 | 26.7 | 0.61              | 1.83 | 49.8 | 23.8 | 1050                      | 41.1         | 3.11         | 30.6         | 106      | 3.87         |
|            | 11.0         | 3.6           | 8.3        | 1400                      | 45.4 | 32.0 | 0.71              | 1.89 | 51.8 | 24.0 | 1400                      | 42.2         | 2.85         | 32.5         | 98       | 4.34         |
|            | 5.5          | 0.9           | 2.1        | 1050                      | 40.6 | 26.0 | 0.64              | 2.17 | 48.0 | 18.7 | 1050                      | 43.0         | 3.15         | 32.3         | 108      | 4.00         |
|            | 5.5          | 0.9           | 2.1        | 1400                      | 42.3 | 31.1 | 0.73              | 2.24 | 49.9 | 18.9 | 1400                      | 44.1         | 2.88         | 34.3         | 99       | 4.49         |
| 70         | 8.3          | 2.0           | 4.6        | 1050                      | 41.9 | 26.4 | 0.63              | 2.06 | 48.9 | 20.3 | 1050                      | 45.1         | 3.19         | 34.2         | 110      | 4.14         |
|            | 8.3          | 2.0           | 4.6        | 1400                      | 43.6 | 31.7 | 0.73              | 2.13 | 50.9 | 20.5 | 1400                      | 46.3         | 2.91         | 36.3         | 101      | 4.65         |
|            | 11.0         | 3.5           | 8.1        | 1050                      | 42.5 | 26.6 | 0.63              | 1.99 | 49.3 | 21.4 | 1050                      | 45.7         | 3.20         | 34.8         | 110      | 4.18         |
|            | 11.0         | 3.5           | 8.1        | 1400                      | 44.3 | 31.9 | 0.72              | 2.05 | 51.3 | 21.6 | 1400                      | 46.9         | 2.93         | 36.9         | 101      | 4.70         |
|            | 5.5          | 0.8           | 1.8        | 1050                      | 38.0 | 24.8 | 0.65              | 2.37 | 46.1 | 16.1 | 1050                      | 47.6         | 3.24         | 36.6         | 112      | 4.31         |
| 80         | 5.5          | 0.8           | 1.8        | 1400                      | 39.6 | 29.7 | 0.75              | 2.45 | 48.0 | 16.2 | 1400                      | 48.9         | 2.96         | 38.8         | 102      | 4.84         |
|            | 8.3          | 2.0           | 4.6        | 1050                      | 39.6 | 25.5 | 0.64              | 2.25 | 47.3 | 17.6 | 1050                      | 49.9         | 3.29         | 38.6         | 114      | 4.44         |
|            | 8.3          | 2.0           | 4.6        | 1400                      | 41.3 | 30.6 | 0.74              | 2.33 | 49.2 | 17.8 | 1400                      | 51.2         | 3.01         | 41.0         | 104      | 4.99         |
|            | 11.0         | 3.2           | 7.4        | 1050                      | 40.4 | 25.9 | 0.64              | 2.19 | 47.9 | 18.4 | 1050                      | 51.1         | 3.33         | 39.7         | 115      | 4.51         |
|            | 11.0         | 3.2           | 7.4        | 1400                      | 42.1 | 31.0 | 0.74              | 2.26 | 49.8 | 18.6 | 1400                      | 52.5         | 3.04         | 42.1         | 105      | 5.06         |
| 90         | 5.5          | 0.7           | 1.6        | 1050                      | 35.1 | 23.4 | 0.67              | 2.59 | 44.0 | 13.6 | 1050                      | 52.1         | 3.35         | 40.5         | 116      | 4.56         |
|            | 5.5          | 0.7           | 1.6        | 1400                      | 36.6 | 28.0 | 0.77              | 2.68 | 45.7 | 13.7 | 1400                      | 53.5         | 3.07         | 43.0         | 105      | 5.12         |
|            | 8.3          | 1.9           | 4.4        | 1050                      | 36.8 | 24.2 | 0.66              | 2.46 | 45.2 | 14.9 | 1050                      | 54.5         | 3.42         | 42.6         | 118      | 4.66         |
|            | 8.3          | 1.9           | 4.4        | 1400                      | 38.3 | 29.0 | 0.76              | 2.54 | 47.0 | 15.1 | 1400                      | 55.9         | 3.13         | 45.2         | 107      | 5.24         |
|            | 11.0         | 3.2           | 7.4        | 1050                      | 37.6 | 24.6 | 0.65              | 2.40 | 45.8 | 15.7 | 1050                      | 55.7         | 3.46         | 43.7         | 119      | 4.71         |
| 100        | 11.0         | 3.2           | 7.4        | 1400                      | 39.2 | 29.5 | 0.75              | 2.48 | 47.6 | 15.8 | 1400                      | 57.2         | 3.17         | 46.3         | 108      | 5.29         |
|            | 5.5          | 0.7           | 1.6        | 1050                      | 33.7 | 22.7 | 0.67              | 2.70 | 42.9 | 12.5 | 1050                      | 54.2         | 3.42         | 42.4         | 118      | 4.65         |
|            | 5.5          | 0.7           | 1.6        | 1400                      | 35.1 | 27.2 | 0.77              | 2.79 | 44.7 | 12.6 | 1400                      | 55.6         | 3.12         | 44.9         | 107      | 5.22         |
|            | 8.3          | 1.9           | 4.3        | 1050                      | 35.3 | 23.5 | 0.66              | 2.57 | 44.1 | 13.8 | 1050                      | 56.5         | 3.50         | 44.3         | 120      | 4.73         |
|            | 8.3          | 1.9           | 4.3        | 1400                      | 36.8 | 28.1 | 0.76              | 2.65 | 45.8 | 13.9 | 1400                      | 58.0         | 3.20         | 47.0         | 108      | 5.32         |
| 110        | 11.0         | 3.2           | 7.3        | 1050                      | 36.1 | 23.9 | 0.66              | 2.50 | 44.7 | 14.5 | 1050                      | 57.6         | 3.54         | 45.3         | 121      | 4.77         |
|            | 11.0         | 3.2           | 7.3        | 1400                      | 37.6 | 28.6 | 0.76              | 2.58 | 46.4 | 14.6 | 1400                      | 59.2         | 3.24         | 48.1         | 109      | 5.35         |
|            | 5.5          | 0.7           | 1.6        | 1050                      | 32.3 | 22.0 | 0.68              | 2.81 | 41.9 | 11.5 | 1050                      | 56.3         | 3.48         | 44.2         | 120      | 4.73         |
|            | 5.5          | 0.7           | 1.6        | 1400                      | 33.6 | 26.4 | 0.78              | 2.91 | 43.6 | 11.6 | 1400                      | 57.8         | 3.18         | 46.9         | 108      | 5.32         |
|            | 8.3          | 1.8           | 4.2        | 1050                      | 33.8 | 22.7 | 0.67              | 2.67 | 42.9 | 12.7 | 1050                      | 58.5         | 3.57         | 46.0         | 122      | 4.80         |
| 120        | 8.3          | 1.8           | 4.2        | 1400                      | 35.2 | 27.2 | 0.77              | 2.76 | 44.6 | 12.8 | 1400                      | 60.0         | 3.26         | 48.9         | 110      | 5.39         |
|            | 11.0         | 3.1           | 7.2        | 1050                      | 34.6 | 23.1 | 0.67              | 2.60 | 43.5 | 13.3 | 1050                      | 59.6         | 3.62         | 46.9         | 123      | 4.82         |
|            | 11.0         | 3.1           | 7.2        | 1400                      | 36.0 | 27.7 | 0.77              | 2.69 | 45.2 | 13.4 | 1400                      | 61.1         | 3.31         | 49.8         | 110      | 5.41         |
|            | 5.5          | 0.6           | 1.4        | 1050                      | 29.9 | 21.0 | 0.70              | 3.05 | 40.3 | 9.8  | Operation Not Recommended |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1400                      | 31.1 | 25.1 | 0.81              | 3.15 | 41.9 | 9.9  |                           |              |              |              |          |              |
| 110        | 8.3          | 1.8           | 4.2        | 1050                      | 31.0 | 21.5 | 0.69              | 2.90 | 40.9 | 10.7 |                           |              |              |              |          |              |
|            | 8.3          | 1.8           | 4.2        | 1400                      | 32.3 | 25.7 | 0.80              | 3.00 | 42.6 | 10.8 |                           |              |              |              |          |              |
|            | 11.0         | 2.9           | 6.7        | 1050                      | 31.7 | 21.8 | 0.69              | 2.81 | 41.3 | 11.3 |                           |              |              |              |          |              |
|            | 11.0         | 2.9           | 6.7        | 1400                      | 33.0 | 26.1 | 0.79              | 2.90 | 43.0 | 11.4 |                           |              |              |              |          |              |
| 110        | 5.5          | 0.6           | 1.4        | 1050                      | 28.4 | 20.6 | 0.73              | 3.21 | 39.4 | 8.8  |                           |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1400                      | 29.6 | 24.7 | 0.84              | 3.32 | 40.9 | 8.9  |                           |              |              |              |          |              |
|            | 8.3          | 1.7           | 3.9        | 1050                      | 29.0 | 20.7 | 0.71              | 3.12 | 39.6 | 9.3  |                           |              |              |              |          |              |
|            | 8.3          | 1.7           | 3.9        | 1400                      | 30.2 | 24.8 | 0.82              | 3.22 | 41.2 | 9.4  |                           |              |              |              |          |              |
|            | 11.0         | 2.9           | 6.7        | 1050                      | 29.4 | 20.8 | 0.71              | 3.06 | 39.9 | 9.6  |                           |              |              |              |          |              |
| 120        | 11.0         | 2.9           | 6.7        | 1400                      | 30.6 | 24.9 | 0.81              | 3.16 | 41.5 | 9.7  |                           |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1050                      | 28.0 | 20.9 | 0.75              | 3.33 | 39.4 | 8.4  |                           |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1400                      | 29.1 | 25.0 | 0.86              | 3.44 | 40.9 | 8.5  |                           |              |              |              |          |              |
|            | 8.3          | 1.6           | 3.7        | 1050                      | 28.2 | 20.9 | 0.74              | 3.27 | 39.3 | 8.6  |                           |              |              |              |          |              |
|            | 8.3          | 1.6           | 3.7        | 1400                      | 29.3 | 25.0 | 0.85              | 3.38 | 40.9 | 8.7  |                           |              |              |              |          |              |
| 120        | 11.0         | 2.7           | 6.2        | 1050                      | 28.4 | 20.9 | 0.74              | 3.25 | 39.5 | 8.8  |                           |              |              |              |          |              |
|            | 11.0         | 2.7           | 6.2        | 1400                      | 29.6 | 25.1 | 0.85              | 3.35 | 41.1 | 8.8  |                           |              |              |              |          |              |

#### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

#### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD048

## 1,600 CFM NOMINAL AIRFLOW COOLING/1,600 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM  | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|------|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |      | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 12.0 | 4.8           | 11.1  | Operation Not Recommended |      |      |                   |      |      |      | 1200                      | 34.4 | 3.80 | 22.2 | 97  | 2.65 |
|            | 12.0 | 4.8           | 11.1  |                           |      |      |                   |      |      |      | 1600                      | 35.3 | 3.47 | 23.6 | 90  | 2.98 |
| 30         | 6.0  | 1.3           | 3.0   | 1200                      | 52.0 | 29.3 | 0.56              | 2.14 | 59.3 | 24.3 | 1200                      | 37.1 | 3.84 | 24.7 | 99  | 2.83 |
|            | 6.0  | 1.3           | 3.0   | 1600                      | 54.2 | 35.1 | 0.65              | 2.22 | 61.7 | 24.4 | 1600                      | 38.0 | 3.51 | 26.2 | 92  | 3.18 |
|            | 9.0  | 2.6           | 6.0   | 1200                      | 52.3 | 29.3 | 0.56              | 2.06 | 59.4 | 25.4 | 1200                      | 38.5 | 3.86 | 26.0 | 100 | 2.92 |
|            | 9.0  | 2.6           | 6.0   | 1600                      | 54.5 | 35.1 | 0.64              | 2.13 | 61.7 | 25.6 | 1600                      | 39.5 | 3.53 | 27.6 | 93  | 3.28 |
|            | 12.0 | 4.5           | 10.4  | 1200                      | 52.5 | 29.4 | 0.56              | 2.03 | 59.4 | 25.9 | 1200                      | 39.3 | 3.87 | 26.8 | 100 | 2.98 |
|            | 12.0 | 4.5           | 10.4  | 1600                      | 54.7 | 35.2 | 0.64              | 2.09 | 61.8 | 26.1 | 1600                      | 40.4 | 3.54 | 28.4 | 93  | 3.34 |
| 40         | 6.0  | 1.2           | 2.8   | 1200                      | 53.2 | 30.3 | 0.57              | 2.32 | 61.1 | 22.9 | 1200                      | 41.9 | 3.92 | 29.1 | 102 | 3.14 |
|            | 6.0  | 1.2           | 2.8   | 1600                      | 55.4 | 36.3 | 0.66              | 2.40 | 63.5 | 23.1 | 1600                      | 43.0 | 3.58 | 30.9 | 95  | 3.52 |
|            | 9.0  | 2.6           | 6.0   | 1200                      | 53.4 | 30.4 | 0.57              | 2.24 | 61.1 | 23.9 | 1200                      | 43.8 | 3.95 | 30.9 | 104 | 3.25 |
|            | 9.0  | 2.6           | 6.0   | 1600                      | 55.7 | 36.4 | 0.65              | 2.31 | 63.5 | 24.1 | 1600                      | 45.0 | 3.61 | 32.8 | 96  | 3.65 |
|            | 12.0 | 4.4           | 10.2  | 1200                      | 53.7 | 30.4 | 0.57              | 2.18 | 61.1 | 24.6 | 1200                      | 44.9 | 3.97 | 31.8 | 105 | 3.31 |
|            | 12.0 | 4.4           | 10.2  | 1600                      | 55.9 | 36.4 | 0.65              | 2.26 | 63.6 | 24.8 | 1600                      | 46.1 | 3.63 | 33.8 | 97  | 3.72 |
| 50         | 6.0  | 1.1           | 2.5   | 1200                      | 52.6 | 30.7 | 0.58              | 2.60 | 61.5 | 20.2 | 1200                      | 47.2 | 4.01 | 33.9 | 106 | 3.45 |
|            | 6.0  | 1.1           | 2.5   | 1600                      | 54.8 | 36.8 | 0.67              | 2.69 | 63.9 | 20.4 | 1600                      | 48.5 | 3.67 | 36.0 | 98  | 3.87 |
|            | 9.0  | 2.5           | 5.8   | 1200                      | 53.5 | 30.9 | 0.58              | 2.44 | 61.8 | 21.9 | 1200                      | 49.6 | 4.06 | 36.1 | 108 | 3.58 |
|            | 9.0  | 2.5           | 5.8   | 1600                      | 55.7 | 37.0 | 0.66              | 2.52 | 64.3 | 22.1 | 1600                      | 50.9 | 3.71 | 38.3 | 99  | 4.02 |
|            | 12.0 | 4.2           | 9.7   | 1200                      | 53.8 | 30.9 | 0.57              | 2.37 | 61.9 | 22.7 | 1200                      | 50.9 | 4.08 | 37.3 | 109 | 3.65 |
|            | 12.0 | 4.2           | 9.7   | 1600                      | 56.0 | 37.0 | 0.66              | 2.45 | 64.3 | 22.9 | 1600                      | 52.2 | 3.73 | 39.6 | 100 | 4.10 |
| 60         | 6.0  | 1.0           | 2.3   | 1200                      | 50.7 | 30.2 | 0.60              | 2.85 | 60.4 | 17.8 | 1200                      | 52.8 | 4.12 | 39.0 | 111 | 3.75 |
|            | 6.0  | 1.0           | 2.3   | 1600                      | 52.8 | 36.2 | 0.68              | 2.94 | 62.8 | 17.9 | 1600                      | 54.2 | 3.77 | 41.4 | 101 | 4.22 |
|            | 9.0  | 2.4           | 5.5   | 1200                      | 52.1 | 30.6 | 0.59              | 2.67 | 61.2 | 19.5 | 1200                      | 55.6 | 4.18 | 41.6 | 113 | 3.90 |
|            | 9.0  | 2.4           | 5.5   | 1600                      | 54.3 | 36.6 | 0.68              | 2.76 | 63.7 | 19.7 | 1600                      | 57.1 | 3.82 | 44.1 | 103 | 4.38 |
|            | 12.0 | 4.0           | 9.2   | 1200                      | 52.7 | 30.7 | 0.58              | 2.59 | 61.5 | 20.4 | 1200                      | 57.2 | 4.21 | 43.0 | 114 | 3.98 |
|            | 12.0 | 4.0           | 9.2   | 1600                      | 54.9 | 36.8 | 0.67              | 2.67 | 64.0 | 20.5 | 1600                      | 58.8 | 3.85 | 45.6 | 104 | 4.47 |
| 70         | 6.0  | 1.0           | 2.3   | 1200                      | 48.3 | 29.5 | 0.61              | 3.13 | 59.0 | 15.4 | 1200                      | 58.6 | 4.24 | 44.2 | 115 | 4.05 |
|            | 6.0  | 1.0           | 2.3   | 1600                      | 50.3 | 35.3 | 0.70              | 3.24 | 61.3 | 15.5 | 1600                      | 60.2 | 3.88 | 46.9 | 105 | 4.54 |
|            | 9.0  | 2.3           | 5.3   | 1200                      | 50.0 | 30.0 | 0.60              | 2.93 | 60.0 | 17.0 | 1200                      | 61.9 | 4.32 | 47.2 | 118 | 4.20 |
|            | 9.0  | 2.3           | 5.3   | 1600                      | 52.1 | 35.9 | 0.69              | 3.03 | 62.4 | 17.2 | 1600                      | 63.6 | 3.95 | 50.1 | 107 | 4.72 |
|            | 12.0 | 3.8           | 8.8   | 1200                      | 50.8 | 30.2 | 0.59              | 2.84 | 60.5 | 17.9 | 1200                      | 63.8 | 4.36 | 48.9 | 119 | 4.29 |
|            | 12.0 | 3.8           | 8.8   | 1600                      | 52.9 | 36.2 | 0.68              | 2.93 | 62.9 | 18.0 | 1600                      | 65.5 | 3.99 | 51.9 | 108 | 4.81 |
| 80         | 6.0  | 0.9           | 2.1   | 1200                      | 45.7 | 28.7 | 0.63              | 3.45 | 57.5 | 13.2 | 1200                      | 64.6 | 4.38 | 49.6 | 120 | 4.32 |
|            | 6.0  | 0.9           | 2.1   | 1600                      | 47.6 | 34.4 | 0.72              | 3.57 | 59.8 | 13.3 | 1600                      | 66.3 | 4.01 | 52.6 | 108 | 4.85 |
|            | 9.0  | 2.3           | 5.3   | 1200                      | 47.5 | 29.2 | 0.62              | 3.23 | 58.5 | 14.7 | 1200                      | 68.4 | 4.47 | 53.0 | 123 | 4.48 |
|            | 9.0  | 2.3           | 5.3   | 1600                      | 49.4 | 35.0 | 0.71              | 3.34 | 60.8 | 14.8 | 1600                      | 70.2 | 4.09 | 56.2 | 111 | 5.03 |
|            | 12.0 | 3.6           | 8.3   | 1200                      | 48.3 | 29.5 | 0.61              | 3.13 | 59.0 | 15.5 | 1200                      | 70.5 | 4.53 | 54.9 | 124 | 4.56 |
|            | 12.0 | 3.6           | 8.3   | 1600                      | 50.3 | 35.3 | 0.70              | 3.23 | 61.4 | 15.6 | 1600                      | 72.4 | 4.14 | 58.3 | 112 | 5.12 |
| 85         | 6.0  | 0.9           | 2.1   | 1200                      | 44.4 | 28.4 | 0.64              | 3.64 | 56.8 | 12.2 | 1200                      | 67.6 | 4.46 | 52.3 | 122 | 4.45 |
|            | 6.0  | 0.9           | 2.1   | 1600                      | 46.2 | 34.0 | 0.74              | 3.76 | 59.1 | 12.3 | 1600                      | 69.4 | 4.07 | 55.5 | 110 | 4.99 |
|            | 9.0  | 2.3           | 5.2   | 1200                      | 46.1 | 28.8 | 0.63              | 3.40 | 57.7 | 13.5 | 1200                      | 71.7 | 4.56 | 55.9 | 125 | 4.60 |
|            | 9.0  | 2.3           | 5.2   | 1600                      | 48.0 | 34.5 | 0.72              | 3.52 | 60.0 | 13.6 | 1600                      | 73.6 | 4.17 | 59.3 | 113 | 5.17 |
|            | 12.0 | 3.6           | 8.2   | 1200                      | 47.0 | 29.1 | 0.62              | 3.29 | 58.2 | 14.3 | 1200                      | 73.9 | 4.62 | 57.9 | 127 | 4.69 |
|            | 12.0 | 3.6           | 8.2   | 1600                      | 48.9 | 34.8 | 0.71              | 3.40 | 60.6 | 14.4 | 1600                      | 75.9 | 4.23 | 61.4 | 114 | 5.26 |
| 90         | 6.0  | 0.9           | 2.1   | 1200                      | 43.1 | 28.1 | 0.65              | 3.82 | 56.1 | 11.3 | 1200                      | 70.6 | 4.53 | 55.0 | 125 | 4.57 |
|            | 6.0  | 0.9           | 2.1   | 1600                      | 44.9 | 33.6 | 0.75              | 3.95 | 58.4 | 11.4 | 1600                      | 72.5 | 4.14 | 58.4 | 112 | 5.13 |
|            | 9.0  | 2.2           | 5.1   | 1200                      | 44.8 | 28.4 | 0.64              | 3.57 | 57.0 | 12.5 | 1200                      | 74.9 | 4.65 | 58.8 | 128 | 4.72 |
|            | 9.0  | 2.2           | 5.1   | 1600                      | 46.6 | 34.1 | 0.73              | 3.69 | 59.2 | 12.6 | 1600                      | 76.9 | 4.25 | 62.4 | 115 | 5.30 |
|            | 12.0 | 3.5           | 8.1   | 1200                      | 45.6 | 28.7 | 0.63              | 3.46 | 57.4 | 13.2 | 1200                      | 77.3 | 4.72 | 60.9 | 130 | 4.80 |
|            | 12.0 | 3.5           | 8.1   | 1600                      | 47.5 | 34.3 | 0.72              | 3.57 | 59.7 | 13.3 | 1600                      | 79.3 | 4.31 | 64.6 | 116 | 5.39 |
| 100        | 6.0  | 0.8           | 1.8   | 1200                      | 40.8 | 27.8 | 0.68              | 4.24 | 55.3 | 9.6  | Operation Not Recommended |      |      |      |     |      |
|            | 6.0  | 0.8           | 1.8   | 1600                      | 42.5 | 33.3 | 0.78              | 4.39 | 57.5 | 9.7  |                           |      |      |      |     |      |
|            | 9.0  | 2.1           | 4.9   | 1200                      | 42.2 | 27.9 | 0.66              | 3.97 | 55.8 | 10.6 |                           |      |      |      |     |      |
|            | 9.0  | 2.1           | 4.9   | 1600                      | 44.0 | 33.4 | 0.76              | 4.10 | 58.0 | 10.7 |                           |      |      |      |     |      |
|            | 12.0 | 3.3           | 7.6   | 1200                      | 43.0 | 28.1 | 0.65              | 3.83 | 56.1 | 11.2 |                           |      |      |      |     |      |
|            | 12.0 | 3.3           | 7.6   | 1600                      | 44.8 | 33.6 | 0.75              | 3.96 | 58.3 | 11.3 |                           |      |      |      |     |      |
| 110        | 6.0  | 0.8           | 1.8   | 1200                      | 39.2 | 27.8 | 0.71              | 4.68 | 55.2 | 8.4  |                           |      |      |      |     |      |
|            | 6.0  | 0.8           | 1.8   | 1600                      | 40.8 | 33.3 | 0.82              | 4.84 | 57.4 | 8.4  |                           |      |      |      |     |      |
|            | 9.0  | 2.0           | 4.6   | 1200                      | 40.1 | 27.9 | 0.69              | 4.42 | 55.2 | 9.1  |                           |      |      |      |     |      |
|            | 9.0  | 2.0           | 4.6   | 1600                      | 41.8 | 33.4 | 0.80              | 4.57 | 57.4 | 9.2  |                           |      |      |      |     |      |
|            | 12.0 | 3.2           | 7.4   | 1200                      | 40.7 | 27.9 | 0.69              | 4.27 | 55.3 | 9.5  |                           |      |      |      |     |      |
|            | 12.0 | 3.2           | 7.4   | 1600                      | 42.4 | 33.5 | 0.79              | 4.41 | 57.5 | 9.6  |                           |      |      |      |     |      |
| 120        | 6.0  | 0.7           | 1.6   | 1200                      | 38.1 | 28.7 | 0.75              | 5.25 | 56.1 | 7.3  |                           |      |      |      |     |      |
|            | 6.0  | 0.7           | 1.6   | 1600                      | 39.7 | 34.4 | 0.87              | 5.42 | 58.3 | 7.3  |                           |      |      |      |     |      |
|            | 9.0  | 1.9           | 4.4   | 1200                      | 39.2 | 28.8 | 0.74              | 4.97 | 56.2 | 7.9  |                           |      |      |      |     |      |
|            | 9.0  | 1.9           | 4.4   | 1600                      | 40.8 | 34.5 | 0.85              | 5.14 | 58.4 | 7.9  |                           |      |      |      |     |      |
|            | 12.0 | 3.0           | 6.9   | 1200                      | 39.8 | 28.9 | 0.73              | 4.82 | 56.2 | 8.3  |                           |      |      |      |     |      |
|            | 12.0 | 3.0           | 6.9   | 1600                      | 41.4 | 34.6 | 0.84              | 4.98 | 58.5 | 8.3  |                           |      |      |      |     |      |

### LEGEND

|       |   |   |
|-------|---|---|
| AHRI  | — | Air Conditioning, Heating and Refrigeration Institute |
| COP   | — | Coefficient of Performance                            |
| db    | — | Dry Bulb  |
| EER   | — | Energy Efficiency Ratio                               |
| EWT   | — | Entering Water Temperature                            |
| GPM   | — | Gallons Per Minute                                    |
| HE    | — | Heat of Extraction (MBtuh)                            |
| ISO   | — | International Organization for Standardization        |
| LAT   | — | Leaving Air Temperature (F)                           |
| MBtuh | — | Btuh in Thousands                                     |
| TC    | — | Total Capacity (MBtuh)                                |
| THC   | — | Total Heating Capacity (MBtuh)                        |
| THR   | — | Total Heat Rejection (MBtuh)                          |
| TSC   | — | Total Sensible Capacity (MBtuh)                       |
| wb    | — | Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD060

### 1,950 CFM NOMINAL AIRFLOW COOLING/1,950 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM          | PRESSURE DROP |              | COOLING                   |      |      |                   |      |      |      | HEATING                   |              |              |              |          |              |
|------------|--------------|---------------|--------------|---------------------------|------|------|-------------------|------|------|------|---------------------------|--------------|--------------|--------------|----------|--------------|
|            |              | PSI           | ft wg        | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC          | kW           | HE           | LAT      | COP          |
| 20         | 15.0<br>15.0 | 5.0<br>5.0    | 11.6<br>11.6 | Operation Not Recommended |      |      |                   |      |      |      | 1465<br>1950              | 40.8<br>41.9 | 4.43<br>4.05 | 26.6<br>28.2 | 96<br>90 | 2.70<br>3.03 |
| 30         | 7.5          | 0.6           | 1.4          | 1465                      | 61.8 | 36.2 | 0.59              | 2.64 | 70.8 | 23.4 | 1465                      | 44.1         | 4.50         | 29.6         | 98       | 2.88         |
|            | 7.5          | 0.6           | 1.4          | 1950                      | 64.3 | 43.4 | 0.67              | 2.73 | 73.6 | 23.6 | 1950                      | 45.3         | 4.11         | 31.4         | 92       | 3.23         |
|            | 11.3         | 2.3           | 5.3          | 1465                      | 63.0 | 36.5 | 0.58              | 2.63 | 72.0 | 23.9 | 1465                      | 45.8         | 4.53         | 31.1         | 99       | 2.96         |
|            | 11.3         | 2.3           | 5.3          | 1950                      | 65.6 | 43.7 | 0.67              | 2.72 | 74.9 | 24.1 | 1950                      | 47.0         | 4.14         | 33.0         | 92       | 3.33         |
|            | 15.0         | 4.8           | 11.1         | 1465                      | 64.9 | 37.4 | 0.58              | 2.60 | 73.8 | 24.9 | 1465                      | 46.7         | 4.55         | 32.0         | 100      | 3.01         |
|            | 15.0         | 4.8           | 11.1         | 1950                      | 67.6 | 44.8 | 0.66              | 2.69 | 76.7 | 25.1 | 1950                      | 48.0         | 4.16         | 33.9         | 93       | 3.38         |
| 40         | 7.5          | 0.5           | 1.2          | 1465                      | 64.9 | 38.6 | 0.59              | 2.86 | 74.6 | 22.7 | 1465                      | 50.0         | 4.61         | 34.9         | 102      | 3.18         |
|            | 7.5          | 0.5           | 1.2          | 1950                      | 67.5 | 46.2 | 0.68              | 2.96 | 77.6 | 22.9 | 1950                      | 51.3         | 4.22         | 37.0         | 94       | 3.57         |
|            | 11.3         | 2.2           | 5.1          | 1465                      | 65.4 | 38.7 | 0.59              | 2.76 | 74.9 | 23.7 | 1465                      | 52.1         | 4.65         | 36.8         | 103      | 3.28         |
|            | 11.3         | 2.2           | 5.1          | 1950                      | 68.2 | 46.3 | 0.68              | 2.85 | 77.8 | 23.9 | 1950                      | 53.5         | 4.25         | 39.1         | 95       | 3.69         |
|            | 15.0         | 4.5           | 10.4         | 1465                      | 66.0 | 38.8 | 0.59              | 2.72 | 75.3 | 24.3 | 1465                      | 53.3         | 4.67         | 37.9         | 104      | 3.34         |
|            | 15.0         | 4.5           | 10.4         | 1950                      | 68.8 | 46.4 | 0.67              | 2.81 | 78.3 | 24.5 | 1950                      | 54.7         | 4.27         | 40.2         | 96       | 3.75         |
| 50         | 7.5          | 0.4           | 0.9          | 1465                      | 65.4 | 39.8 | 0.61              | 3.15 | 76.2 | 20.8 | 1465                      | 56.1         | 4.73         | 40.5         | 105      | 3.48         |
|            | 7.5          | 0.4           | 0.9          | 1950                      | 68.1 | 47.6 | 0.70              | 3.26 | 79.2 | 20.9 | 1950                      | 57.6         | 4.32         | 43.0         | 97       | 3.91         |
|            | 11.3         | 2.1           | 4.9          | 1465                      | 66.1 | 39.8 | 0.60              | 2.97 | 76.2 | 22.2 | 1465                      | 58.7         | 4.77         | 42.9         | 107      | 3.60         |
|            | 11.3         | 2.1           | 4.9          | 1950                      | 68.8 | 47.6 | 0.69              | 3.07 | 79.2 | 22.4 | 1950                      | 60.3         | 4.37         | 45.5         | 99       | 4.05         |
|            | 15.0         | 4.3           | 9.9          | 1465                      | 66.4 | 39.8 | 0.60              | 2.91 | 76.3 | 22.9 | 1465                      | 60.1         | 4.80         | 44.1         | 108      | 3.67         |
|            | 15.0         | 4.3           | 9.9          | 1950                      | 69.2 | 47.6 | 0.69              | 3.00 | 79.4 | 23.0 | 1950                      | 61.7         | 4.39         | 46.8         | 99       | 4.12         |
| 60         | 7.5          | 0.3           | 0.7          | 1465                      | 64.0 | 39.9 | 0.62              | 3.50 | 76.0 | 18.3 | 1465                      | 62.5         | 4.84         | 46.3         | 109      | 3.78         |
|            | 7.5          | 0.3           | 0.7          | 1950                      | 66.7 | 47.8 | 0.72              | 3.62 | 79.0 | 18.4 | 1950                      | 64.2         | 4.43         | 49.1         | 100      | 4.24         |
|            | 11.3         | 2.1           | 4.9          | 1465                      | 65.3 | 40.1 | 0.61              | 3.26 | 76.4 | 20.0 | 1465                      | 65.5         | 4.90         | 49.0         | 111      | 3.92         |
|            | 11.3         | 2.1           | 4.9          | 1950                      | 68.0 | 48.0 | 0.71              | 3.37 | 79.4 | 20.2 | 1950                      | 67.2         | 4.48         | 52.0         | 102      | 4.40         |
|            | 15.0         | 4.1           | 9.5          | 1465                      | 65.7 | 40.1 | 0.61              | 3.17 | 76.5 | 20.7 | 1465                      | 67.1         | 4.93         | 50.5         | 112      | 3.99         |
|            | 15.0         | 4.1           | 9.5          | 1950                      | 68.4 | 48.0 | 0.70              | 3.27 | 79.5 | 20.9 | 1950                      | 68.9         | 4.51         | 53.5         | 103      | 4.48         |
| 70         | 7.5          | 0.3           | 0.7          | 1465                      | 61.6 | 39.2 | 0.64              | 3.84 | 74.7 | 16.0 | 1465                      | 68.9         | 4.97         | 52.0         | 114      | 4.06         |
|            | 7.5          | 0.3           | 0.7          | 1950                      | 64.2 | 46.9 | 0.73              | 3.97 | 77.7 | 16.2 | 1950                      | 70.7         | 4.54         | 55.2         | 104      | 4.56         |
|            | 11.3         | 2.0           | 4.6          | 1465                      | 63.4 | 39.7 | 0.63              | 3.61 | 75.7 | 17.6 | 1465                      | 72.2         | 5.03         | 55.0         | 116      | 4.20         |
|            | 11.3         | 2.0           | 4.6          | 1950                      | 66.0 | 47.6 | 0.72              | 3.73 | 78.7 | 17.7 | 1950                      | 74.1         | 4.60         | 58.4         | 105      | 4.72         |
|            | 15.0         | 3.9           | 9.0          | 1465                      | 64.1 | 39.9 | 0.62              | 3.49 | 76.1 | 18.4 | 1465                      | 73.9         | 5.07         | 56.6         | 117      | 4.28         |
|            | 15.0         | 3.9           | 9.0          | 1950                      | 66.8 | 47.8 | 0.72              | 3.61 | 79.1 | 18.5 | 1950                      | 75.9         | 4.63         | 60.1         | 106      | 4.80         |
| 80         | 7.5          | 0.2           | 0.5          | 1465                      | 58.6 | 38.1 | 0.65              | 4.23 | 73.1 | 13.9 | 1465                      | 75.1         | 5.09         | 57.7         | 117      | 4.32         |
|            | 7.5          | 0.2           | 0.5          | 1950                      | 61.1 | 45.6 | 0.75              | 4.37 | 76.0 | 14.0 | 1950                      | 77.1         | 4.65         | 61.2         | 107      | 4.85         |
|            | 11.3         | 1.9           | 4.4          | 1465                      | 60.7 | 38.9 | 0.64              | 3.96 | 74.2 | 15.3 | 1465                      | 78.6         | 5.16         | 60.8         | 120      | 4.46         |
|            | 11.3         | 1.9           | 4.4          | 1950                      | 63.2 | 46.6 | 0.74              | 4.09 | 77.2 | 15.4 | 1950                      | 80.7         | 4.72         | 64.5         | 108      | 5.01         |
|            | 15.0         | 3.6           | 8.3          | 1465                      | 61.7 | 39.2 | 0.64              | 3.83 | 74.8 | 16.1 | 1465                      | 80.4         | 5.21         | 62.5         | 121      | 4.53         |
|            | 15.0         | 3.6           | 8.3          | 1950                      | 64.3 | 47.0 | 0.73              | 3.96 | 77.8 | 16.2 | 1950                      | 82.6         | 4.76         | 66.3         | 109      | 5.08         |
| 85         | 7.5          | 0.2           | 0.5          | 1465                      | 56.9 | 37.4 | 0.66              | 4.44 | 72.1 | 12.8 | 1465                      | 78.1         | 5.15         | 60.4         | 119      | 4.44         |
|            | 7.5          | 0.2           | 0.5          | 1950                      | 59.3 | 44.8 | 0.76              | 4.59 | 75.0 | 12.9 | 1950                      | 80.1         | 4.71         | 64.0         | 108      | 4.98         |
|            | 11.3         | 1.9           | 4.3          | 1465                      | 59.1 | 38.3 | 0.65              | 4.16 | 73.3 | 14.2 | 1465                      | 81.6         | 5.23         | 63.5         | 122      | 4.57         |
|            | 11.3         | 1.9           | 4.3          | 1950                      | 61.6 | 45.8 | 0.74              | 4.30 | 76.3 | 14.3 | 1950                      | 83.7         | 4.79         | 67.4         | 110      | 5.13         |
|            | 15.0         | 3.6           | 8.2          | 1465                      | 60.2 | 38.7 | 0.64              | 4.03 | 73.9 | 14.9 | 1465                      | 83.4         | 5.28         | 65.1         | 123      | 4.63         |
|            | 15.0         | 3.6           | 8.2          | 1950                      | 62.7 | 46.3 | 0.74              | 4.17 | 76.9 | 15.0 | 1950                      | 85.6         | 4.83         | 69.1         | 111      | 5.20         |
| 90         | 7.5          | 0.2           | 0.5          | 1465                      | 55.2 | 36.8 | 0.67              | 4.66 | 71.2 | 11.9 | 1465                      | 81.0         | 5.22         | 63.0         | 121      | 4.55         |
|            | 7.5          | 0.2           | 0.5          | 1950                      | 57.5 | 44.0 | 0.77              | 4.82 | 74.0 | 11.9 | 1950                      | 83.2         | 4.77         | 66.9         | 109      | 5.11         |
|            | 11.3         | 1.8           | 4.2          | 1465                      | 57.5 | 37.7 | 0.66              | 4.37 | 72.4 | 13.2 | 1465                      | 84.5         | 5.30         | 66.2         | 123      | 4.67         |
|            | 11.3         | 1.8           | 4.2          | 1950                      | 59.9 | 45.1 | 0.75              | 4.51 | 75.3 | 13.3 | 1950                      | 86.8         | 4.85         | 70.2         | 111      | 5.25         |
|            | 15.0         | 3.5           | 8.1          | 1465                      | 58.6 | 38.1 | 0.65              | 4.23 | 73.1 | 13.9 | 1465                      | 86.3         | 5.35         | 67.7         | 125      | 4.73         |
|            | 15.0         | 3.5           | 8.1          | 1950                      | 61.1 | 45.6 | 0.75              | 4.37 | 76.0 | 14.0 | 1950                      | 88.6         | 4.89         | 71.9         | 112      | 5.31         |
| 100        | 7.5          | 0.1           | 0.2          | 1465                      | 51.7 | 35.3 | 0.68              | 5.15 | 69.3 | 10.0 | Operation Not Recommended |              |              |              |          |              |
|            | 7.5          | 0.1           | 0.2          | 1950                      | 53.9 | 42.3 | 0.78              | 5.32 | 72.1 | 10.1 |                           |              |              |              |          |              |
|            | 11.3         | 1.8           | 4.2          | 1465                      | 54.0 | 36.3 | 0.67              | 4.83 | 70.5 | 11.2 |                           |              |              |              |          |              |
|            | 11.3         | 1.8           | 4.2          | 1950                      | 56.2 | 43.4 | 0.77              | 4.99 | 73.3 | 11.3 |                           |              |              |              |          |              |
|            | 15.0         | 3.3           | 7.6          | 1465                      | 55.2 | 36.7 | 0.67              | 4.67 | 71.1 | 11.8 |                           |              |              |              |          |              |
|            | 15.0         | 3.3           | 7.6          | 1950                      | 57.5 | 44.0 | 0.77              | 4.83 | 74.0 | 11.9 |                           |              |              |              |          |              |
| 110        | 7.5          | 0.1           | 0.2          | 1465                      | 48.2 | 33.8 | 0.70              | 5.70 | 67.7 | 8.5  |                           |              |              |              |          |              |
|            | 7.5          | 0.1           | 0.2          | 1950                      | 50.2 | 40.5 | 0.81              | 5.89 | 70.4 | 8.5  |                           |              |              |              |          |              |
|            | 11.3         | 1.7           | 3.9          | 1465                      | 50.4 | 34.8 | 0.69              | 5.35 | 68.7 | 9.4  |                           |              |              |              |          |              |
|            | 11.3         | 1.7           | 3.9          | 1950                      | 52.5 | 41.6 | 0.79              | 5.53 | 71.4 | 9.5  |                           |              |              |              |          |              |
|            | 15.0         | 3.1           | 7.2          | 1465                      | 51.5 | 35.2 | 0.68              | 5.18 | 69.2 | 10.0 |                           |              |              |              |          |              |
|            | 15.0         | 3.1           | 7.2          | 1950                      | 53.7 | 42.2 | 0.79              | 5.35 | 72.0 | 10.0 |                           |              |              |              |          |              |
| 120        | 7.5          | 0.0           | 0.0          | 1465                      | 45.0 | 32.5 | 0.72              | 6.32 | 66.6 | 7.1  |                           |              |              |              |          |              |
|            | 7.5          | 0.0           | 0.0          | 1950                      | 46.9 | 39.0 | 0.83              | 6.53 | 69.2 | 7.2  |                           |              |              |              |          |              |
|            | 11.3         | 1.7           | 3.9          | 1465                      | 46.9 | 33.3 | 0.71              | 5.93 | 67.2 | 7.9  |                           |              |              |              |          |              |
|            | 11.3         | 1.7           | 3.9          | 1950                      | 48.9 | 39.9 | 0.82              | 6.13 | 69.9 | 8.0  |                           |              |              |              |          |              |
|            | 15.0         | 2.9           | 6.7          | 1465                      | 48.0 | 33.7 | 0.70              | 5.74 | 67.6 | 8.4  |                           |              |              |              |          |              |
|            | 15.0         | 2.9           | 6.7          | 1950                      | 50.0 | 40.4 | 0.81              | 5.94 | 70.3 | 8.4  |                           |              |              |              |          |              |

#### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

#### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD070

## 2,100 CFM NOMINAL AIRFLOW COOLING/2,100 CFM NOMINAL AIRFLOW HEATING — PSC BLOWER

| EWT<br>(F) | GPM  | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |       |      |      |     |      |
|------------|------|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|-------|------|------|-----|------|
|            |      | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC   | kW   | HE   | LAT | COP  |
| 20         | 16.5 | 9.1           | 21.0  | Operation Not Recommended |      |      |                   |      |      |      | 1575                      | 47.0  | 5.12 | 30.6 | 98  | 2.69 |
|            | 16.5 | 9.1           | 21.0  |                           |      |      |                   |      |      |      | 2100                      | 48.3  | 4.68 | 32.5 | 91  | 3.02 |
| 30         | 8.3  | 2.4           | 5.5   | 1575                      | 70.1 | 40.6 | 0.58              | 3.14 | 80.8 | 22.3 | 1575                      | 50.7  | 5.21 | 33.9 | 100 | 2.85 |
|            | 8.3  | 2.4           | 5.5   | 2100                      | 73.0 | 48.7 | 0.67              | 3.24 | 84.0 | 22.5 | 2100                      | 52.1  | 4.77 | 36.0 | 93  | 3.20 |
|            | 12.4 | 5.2           | 12.0  | 1575                      | 71.0 | 40.9 | 0.58              | 3.01 | 81.2 | 23.6 | 1575                      | 52.8  | 5.26 | 35.8 | 101 | 2.94 |
|            | 12.4 | 5.2           | 12.0  | 2100                      | 73.9 | 49.0 | 0.66              | 3.11 | 84.5 | 23.7 | 2100                      | 54.2  | 4.81 | 37.9 | 94  | 3.30 |
|            | 16.5 | 8.0           | 18.5  | 1575                      | 71.5 | 41.1 | 0.57              | 2.96 | 81.6 | 24.2 | 1575                      | 53.9  | 5.28 | 36.8 | 102 | 2.99 |
|            | 16.5 | 8.0           | 18.5  | 2100                      | 74.5 | 49.2 | 0.66              | 3.05 | 84.9 | 24.4 | 2100                      | 55.4  | 4.83 | 39.0 | 94  | 3.36 |
| 40         | 8.3  | 2.2           | 5.1   | 1575                      | 75.2 | 44.0 | 0.59              | 3.37 | 86.7 | 22.3 | 1575                      | 57.6  | 5.36 | 40.1 | 104 | 3.15 |
|            | 8.3  | 2.2           | 5.1   | 2100                      | 78.3 | 52.7 | 0.67              | 3.48 | 90.2 | 22.5 | 2100                      | 59.2  | 4.91 | 42.6 | 96  | 3.53 |
|            | 12.4 | 4.9           | 11.3  | 1575                      | 75.7 | 44.1 | 0.58              | 3.23 | 86.7 | 23.5 | 1575                      | 60.4  | 5.42 | 42.6 | 105 | 3.26 |
|            | 12.4 | 4.9           | 11.3  | 2100                      | 78.9 | 52.9 | 0.67              | 3.33 | 90.2 | 23.7 | 2100                      | 62.0  | 4.96 | 45.2 | 97  | 3.66 |
|            | 16.5 | 7.5           | 17.3  | 1575                      | 76.0 | 44.2 | 0.58              | 3.15 | 86.7 | 24.1 | 1575                      | 61.9  | 5.46 | 44.0 | 106 | 3.33 |
|            | 16.5 | 7.5           | 17.3  | 2100                      | 79.2 | 52.9 | 0.67              | 3.26 | 90.2 | 24.3 | 2100                      | 63.6  | 4.99 | 46.7 | 98  | 3.74 |
| 50         | 8.3  | 2.0           | 4.6   | 1575                      | 76.2 | 45.4 | 0.60              | 3.72 | 88.9 | 20.5 | 1575                      | 65.2  | 5.52 | 47.0 | 108 | 3.46 |
|            | 8.3  | 2.0           | 4.6   | 2100                      | 79.4 | 54.4 | 0.68              | 3.85 | 92.5 | 20.6 | 2100                      | 67.0  | 5.05 | 49.9 | 100 | 3.89 |
|            | 12.4 | 4.5           | 10.4  | 1575                      | 77.0 | 45.4 | 0.59              | 3.50 | 89.0 | 22.0 | 1575                      | 68.7  | 5.60 | 50.1 | 110 | 3.60 |
|            | 12.4 | 4.5           | 10.4  | 2100                      | 80.2 | 54.4 | 0.68              | 3.62 | 92.5 | 22.2 | 2100                      | 70.5  | 5.12 | 53.2 | 101 | 4.04 |
|            | 16.5 | 7.0           | 16.2  | 1575                      | 77.4 | 45.5 | 0.59              | 3.40 | 89.0 | 22.8 | 1575                      | 70.6  | 5.64 | 51.8 | 112 | 3.67 |
|            | 16.5 | 7.0           | 16.2  | 2100                      | 80.6 | 54.5 | 0.68              | 3.51 | 92.5 | 22.9 | 2100                      | 72.5  | 5.15 | 55.0 | 102 | 4.12 |
| 60         | 8.3  | 1.7           | 3.9   | 1575                      | 73.6 | 44.9 | 0.61              | 4.09 | 87.5 | 18.0 | 1575                      | 73.3  | 5.69 | 54.2 | 113 | 3.77 |
|            | 8.3  | 1.7           | 3.9   | 2100                      | 76.6 | 53.8 | 0.70              | 4.22 | 91.0 | 18.1 | 2100                      | 75.2  | 5.21 | 57.5 | 103 | 4.24 |
|            | 12.4 | 4.0           | 9.2   | 1575                      | 75.7 | 45.5 | 0.60              | 3.82 | 88.7 | 19.8 | 1575                      | 77.4  | 5.78 | 57.9 | 115 | 3.92 |
|            | 12.4 | 4.0           | 9.2   | 2100                      | 78.8 | 54.5 | 0.69              | 3.95 | 92.2 | 20.0 | 2100                      | 79.4  | 5.29 | 61.5 | 105 | 4.40 |
|            | 16.5 | 6.4           | 14.8  | 1575                      | 76.4 | 45.7 | 0.60              | 3.70 | 89.1 | 20.7 | 1575                      | 79.7  | 5.83 | 60.0 | 117 | 4.00 |
|            | 16.5 | 6.4           | 14.8  | 2100                      | 79.6 | 54.7 | 0.69              | 3.82 | 92.6 | 20.8 | 2100                      | 81.8  | 5.33 | 63.6 | 106 | 4.50 |
| 70         | 8.3  | 1.7           | 3.9   | 1575                      | 69.9 | 43.6 | 0.62              | 4.50 | 85.3 | 15.5 | 1575                      | 81.5  | 5.87 | 61.6 | 118 | 4.07 |
|            | 8.3  | 1.7           | 3.9   | 2100                      | 72.8 | 52.3 | 0.72              | 4.65 | 88.7 | 15.7 | 2100                      | 83.6  | 5.37 | 65.3 | 107 | 4.57 |
|            | 12.4 | 4.0           | 9.2   | 1575                      | 72.6 | 44.6 | 0.61              | 4.19 | 87.0 | 17.3 | 1575                      | 86.1  | 5.98 | 65.8 | 121 | 4.22 |
|            | 12.4 | 4.0           | 9.2   | 2100                      | 75.7 | 53.4 | 0.71              | 4.34 | 90.4 | 17.5 | 2100                      | 88.4  | 5.47 | 69.8 | 109 | 4.74 |
|            | 16.5 | 6.3           | 14.6  | 1575                      | 73.9 | 45.0 | 0.61              | 4.05 | 87.7 | 18.2 | 1575                      | 88.7  | 6.04 | 68.0 | 122 | 4.30 |
|            | 16.5 | 6.3           | 14.6  | 2100                      | 76.9 | 53.9 | 0.70              | 4.19 | 91.2 | 18.4 | 2100                      | 91.0  | 5.52 | 72.2 | 110 | 4.83 |
| 80         | 8.3  | 1.6           | 3.7   | 1575                      | 65.7 | 42.0 | 0.64              | 4.97 | 82.7 | 13.2 | 1575                      | 89.6  | 6.06 | 68.9 | 123 | 4.33 |
|            | 8.3  | 1.6           | 3.7   | 2100                      | 68.4 | 50.3 | 0.73              | 5.14 | 86.0 | 13.3 | 2100                      | 92.0  | 5.54 | 73.1 | 111 | 4.87 |
|            | 12.4 | 3.8           | 8.8   | 1575                      | 68.7 | 43.2 | 0.63              | 4.63 | 84.5 | 14.8 | 1575                      | 94.6  | 6.19 | 73.3 | 126 | 4.48 |
|            | 12.4 | 3.8           | 8.8   | 2100                      | 71.6 | 51.7 | 0.72              | 4.79 | 87.9 | 15.0 | 2100                      | 97.2  | 5.66 | 77.8 | 113 | 5.03 |
|            | 16.5 | 6.1           | 14.1  | 1575                      | 70.2 | 43.7 | 0.62              | 4.47 | 85.4 | 15.7 | 1575                      | 97.3  | 6.26 | 75.7 | 127 | 4.56 |
|            | 16.5 | 6.1           | 14.1  | 2100                      | 73.1 | 52.4 | 0.72              | 4.62 | 88.8 | 15.8 | 2100                      | 99.9  | 5.72 | 80.3 | 114 | 5.12 |
| 85         | 8.3  | 1.6           | 3.7   | 1575                      | 63.5 | 41.1 | 0.65              | 5.24 | 81.4 | 12.1 | 1575                      | 93.5  | 6.16 | 72.3 | 125 | 4.45 |
|            | 8.3  | 1.6           | 3.7   | 2100                      | 66.2 | 49.2 | 0.74              | 5.42 | 84.7 | 12.2 | 2100                      | 96.0  | 5.63 | 76.8 | 112 | 4.99 |
|            | 12.4 | 3.8           | 8.7   | 1575                      | 66.5 | 42.3 | 0.64              | 4.88 | 83.2 | 13.6 | 1575                      | 98.6  | 6.30 | 76.8 | 128 | 4.59 |
|            | 12.4 | 3.8           | 8.7   | 2100                      | 69.3 | 50.6 | 0.73              | 5.05 | 86.5 | 13.7 | 2100                      | 101.2 | 5.76 | 81.5 | 115 | 5.15 |
|            | 16.5 | 6.0           | 13.9  | 1575                      | 68.0 | 42.9 | 0.63              | 4.71 | 84.1 | 14.4 | 1575                      | 101.3 | 6.38 | 79.2 | 130 | 4.65 |
|            | 16.5 | 6.0           | 13.9  | 2100                      | 70.9 | 51.4 | 0.72              | 4.87 | 87.5 | 14.5 | 2100                      | 104.0 | 5.83 | 84.0 | 116 | 5.22 |
| 90         | 8.3  | 1.6           | 3.7   | 1575                      | 61.3 | 40.2 | 0.65              | 5.52 | 80.2 | 11.1 | 1575                      | 97.4  | 6.26 | 75.8 | 127 | 4.56 |
|            | 8.3  | 1.6           | 3.7   | 2100                      | 63.9 | 48.1 | 0.75              | 5.70 | 83.4 | 11.2 | 2100                      | 100.0 | 5.73 | 80.4 | 114 | 5.12 |
|            | 12.4 | 3.7           | 8.5   | 1575                      | 64.3 | 41.4 | 0.64              | 5.14 | 81.9 | 12.5 | 1575                      | 102.6 | 6.42 | 80.3 | 130 | 4.69 |
|            | 12.4 | 3.7           | 8.5   | 2100                      | 67.0 | 49.6 | 0.74              | 5.31 | 85.1 | 12.6 | 2100                      | 105.3 | 5.87 | 85.2 | 116 | 5.26 |
|            | 16.5 | 5.9           | 13.6  | 1575                      | 65.9 | 42.0 | 0.64              | 4.95 | 82.8 | 13.3 | 1575                      | 105.2 | 6.50 | 82.6 | 132 | 4.74 |
|            | 16.5 | 5.9           | 13.6  | 2100                      | 68.6 | 50.3 | 0.73              | 5.12 | 86.1 | 13.4 | 2100                      | 108.0 | 5.94 | 87.7 | 118 | 5.33 |
| 100        | 8.3  | 1.5           | 3.5   | 1575                      | 57.1 | 38.4 | 0.67              | 6.15 | 78.1 | 9.3  | Operation Not Recommended |       |      |      |     |      |
|            | 8.3  | 1.5           | 3.5   | 2100                      | 59.5 | 46.0 | 0.77              | 6.36 | 81.3 | 9.4  |                           |       |      |      |     |      |
|            | 12.4 | 3.5           | 8.1   | 1575                      | 59.9 | 39.5 | 0.66              | 5.72 | 79.4 | 10.5 |                           |       |      |      |     |      |
|            | 12.4 | 3.5           | 8.1   | 2100                      | 62.3 | 47.4 | 0.76              | 5.91 | 82.6 | 10.5 |                           |       |      |      |     |      |
|            | 16.5 | 5.6           | 12.9  | 1575                      | 61.3 | 40.2 | 0.65              | 5.52 | 80.2 | 11.1 |                           |       |      |      |     |      |
|            | 16.5 | 5.6           | 12.9  | 2100                      | 63.9 | 48.1 | 0.75              | 5.70 | 83.4 | 11.2 |                           |       |      |      |     |      |
| 110        | 8.3  | 1.4           | 3.2   | 1575                      | 53.5 | 37.1 | 0.69              | 6.89 | 77.1 | 7.8  |                           |       |      |      |     |      |
|            | 8.3  | 1.4           | 3.2   | 2100                      | 55.8 | 44.4 | 0.80              | 7.12 | 80.2 | 7.8  |                           |       |      |      |     |      |
|            | 12.4 | 3.3           | 7.6   | 1575                      | 55.8 | 37.9 | 0.68              | 6.40 | 77.6 | 8.7  |                           |       |      |      |     |      |
|            | 12.4 | 3.3           | 7.6   | 2100                      | 58.1 | 45.4 | 0.78              | 6.61 | 80.7 | 8.8  |                           |       |      |      |     |      |
|            | 16.5 | 5.3           | 12.2  | 1575                      | 57.0 | 38.4 | 0.67              | 6.17 | 78.1 | 9.2  |                           |       |      |      |     |      |
|            | 16.5 | 5.3           | 12.2  | 2100                      | 59.4 | 46.0 | 0.77              | 6.38 | 81.2 | 9.3  |                           |       |      |      |     |      |
| 120        | 8.3  | 1.3           | 3.0   | 1575                      | 51.1 | 36.5 | 0.71              | 7.75 | 77.6 | 6.6  |                           |       |      |      |     |      |
|            | 8.3  | 1.3           | 3.0   | 2100                      | 53.2 | 43.7 | 0.82              | 8.01 | 80.7 | 6.6  |                           |       |      |      |     |      |
|            | 12.4 | 3.2           | 7.4   | 1575                      | 52.5 | 36.7 | 0.70              | 7.18 | 77.0 | 7.3  |                           |       |      |      |     |      |
|            | 12.4 | 3.2           | 7.4   | 2100                      | 54.7 | 44.0 | 0.80              | 7.42 | 80.1 | 7.4  |                           |       |      |      |     |      |
|            | 16.5 | 5.1           | 11.8  | 1575                      | 53.4 | 37.0 | 0.69              | 6.92 | 77.1 | 7.7  |                           |       |      |      |     |      |
|            | 16.5 | 5.1           | 11.8  | 2100                      | 55.6 | 44.3 | 0.80              | 7.15 | 80.1 | 7.8  |                           |       |      |      |     |      |

### LEGEND

|       |   |   |
|-------|---|---|
| AHRI  | — | Air Conditioning, Heating and Refrigeration Institute |
| COP   | — | Coefficient of Performance                            |
| db    | — | Dry Bulb  |
| EER   | — | Energy Efficiency Ratio                               |
| EWT   | — | Entering Water Temperature                            |
| GPM   | — | Gallons Per Minute                                    |
| HE    | — | Heat of Extraction (MBtuh)                            |
| ISO   | — | International Organization for Standardization        |
| LAT   | — | Leaving Air Temperature (F)                           |
| MBtuh | — | Btuh in Thousands                                     |
| TC    | — | Total Capacity (MBtuh)                                |
| THC   | — | Total Heating Capacity (MBtuh)                        |
| THR   | — | Total Heat Rejection (MBtuh)                          |
| TSC   | — | Total Sensible Capacity (MBtuh)                       |
| wb    | — | Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD018

### 750 CFM NOMINAL AIRFLOW COOLING/700 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM        | PRESSURE DROP |            | COOLING                   |      |      |                   |      |      |      | HEATING                   |              |              |            |              |            |
|------------|------------|---------------|------------|---------------------------|------|------|-------------------|------|------|------|---------------------------|--------------|--------------|------------|--------------|------------|
|            |            | PSI           | ft wg      | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC          | kW           | HE         | LAT          | COP        |
| 20         | 5.5<br>5.5 | 3.9<br>3.9    | 9.0<br>9.0 | Operation Not Recommended |      |      |                   |      |      |      | 550<br>750                | 11.9<br>12.3 | 1.25<br>1.16 | 7.9<br>8.4 | 90.0<br>85.1 | 2.8<br>3.1 |
| 30         | 2.8        | 0.7           | 1.6        | 550                       | 20.3 | 12.4 | 0.61              | 0.75 | 22.8 | 27.3 | 550                       | 13.2         | 1.29         | 9.0        | 92.3         | 3.0        |
|            | 2.8        | 0.7           | 1.6        | 750                       | 21.1 | 14.5 | 0.68              | 0.79 | 23.8 | 26.8 | 750                       | 13.6         | 1.20         | 9.6        | 86.8         | 3.3        |
|            | 4.1        | 2.1           | 4.9        | 550                       | 20.7 | 12.6 | 0.61              | 0.71 | 23.1 | 29.1 | 550                       | 13.7         | 1.31         | 9.5        | 93.1         | 3.1        |
|            | 4.1        | 2.1           | 4.9        | 750                       | 21.5 | 14.7 | 0.68              | 0.75 | 24.1 | 28.6 | 750                       | 14.1         | 1.21         | 10.1       | 87.5         | 3.4        |
|            | 5.5        | 3.5           | 8.1        | 550                       | 21.3 | 12.9 | 0.61              | 0.70 | 23.6 | 30.5 | 550                       | 14.0         | 1.31         | 9.7        | 93.6         | 3.1        |
| 40         | 5.5        | 3.5           | 8.1        | 750                       | 22.1 | 15.0 | 0.68              | 0.74 | 24.6 | 30.0 | 750                       | 14.4         | 1.21         | 10.3       | 87.8         | 3.5        |
|            | 2.8        | 0.6           | 1.4        | 550                       | 20.8 | 12.9 | 0.62              | 0.81 | 23.5 | 25.5 | 550                       | 15.3         | 1.33         | 10.9       | 95.8         | 3.4        |
|            | 2.8        | 0.6           | 1.4        | 750                       | 21.6 | 15.0 | 0.70              | 0.86 | 24.5 | 25.0 | 750                       | 15.8         | 1.23         | 11.6       | 89.5         | 3.8        |
|            | 4.1        | 2.0           | 4.6        | 550                       | 21.3 | 13.1 | 0.61              | 0.97 | 23.9 | 27.6 | 550                       | 16.0         | 1.34         | 11.5       | 96.9         | 3.5        |
|            | 4.1        | 2.0           | 4.6        | 750                       | 22.1 | 15.2 | 0.69              | 0.81 | 24.9 | 27.2 | 750                       | 16.5         | 1.24         | 12.3       | 90.3         | 3.9        |
| 50         | 5.5        | 3.2           | 7.4        | 550                       | 21.5 | 13.2 | 0.61              | 0.75 | 24.0 | 28.6 | 550                       | 16.3         | 1.34         | 11.9       | 97.5         | 3.6        |
|            | 5.5        | 3.2           | 7.4        | 750                       | 22.4 | 15.3 | 0.69              | 0.79 | 25.0 | 28.1 | 750                       | 16.8         | 1.24         | 12.6       | 90.8         | 4.0        |
|            | 2.8        | 0.5           | 1.2        | 550                       | 21.3 | 13.5 | 0.63              | 0.90 | 24.3 | 23.7 | 550                       | 17.5         | 1.35         | 13.0       | 99.5         | 3.8        |
|            | 2.8        | 0.5           | 1.2        | 750                       | 22.1 | 15.7 | 0.71              | 0.95 | 25.3 | 23.3 | 750                       | 18.1         | 1.25         | 13.8       | 92.3         | 4.2        |
|            | 4.1        | 1.7           | 3.9        | 550                       | 21.5 | 13.5 | 0.63              | 0.84 | 24.3 | 25.5 | 550                       | 18.4         | 1.36         | 13.8       | 100.9        | 4.0        |
| 60         | 4.1        | 1.7           | 3.9        | 750                       | 22.3 | 15.7 | 0.70              | 0.89 | 25.4 | 25.1 | 750                       | 18.9         | 1.26         | 14.6       | 93.4         | 4.4        |
|            | 5.5        | 2.8           | 6.5        | 550                       | 21.6 | 13.5 | 0.62              | 0.82 | 24.4 | 26.4 | 550                       | 18.8         | 1.36         | 14.2       | 101.7        | 4.0        |
|            | 5.5        | 2.8           | 6.5        | 750                       | 22.5 | 15.7 | 0.70              | 0.87 | 25.4 | 26.0 | 750                       | 19.4         | 1.26         | 15.1       | 93.9         | 4.5        |
|            | 2.8        | 0.3           | 0.7        | 550                       | 20.6 | 13.4 | 0.68              | 0.99 | 24.0 | 23.7 | 550                       | 19.8         | 1.37         | 15.2       | 103.4        | 4.2        |
|            | 2.8        | 0.3           | 0.7        | 750                       | 21.5 | 15.6 | 0.76              | 1.05 | 25.0 | 23.3 | 750                       | 20.4         | 1.27         | 16.1       | 95.2         | 4.7        |
| 70         | 4.1        | 1.5           | 3.5        | 550                       | 21.1 | 13.5 | 0.67              | 0.93 | 24.3 | 25.5 | 550                       | 20.8         | 1.38         | 16.1       | 105.0        | 4.4        |
|            | 4.1        | 1.5           | 3.5        | 750                       | 22.2 | 15.7 | 0.75              | 0.99 | 25.3 | 25.3 | 750                       | 21.4         | 1.28         | 17.1       | 96.5         | 4.9        |
|            | 5.5        | 2.6           | 6.0        | 550                       | 21.3 | 13.6 | 0.66              | 0.90 | 24.4 | 26.4 | 550                       | 21.3         | 1.39         | 16.6       | 105.9        | 4.5        |
|            | 5.5        | 2.6           | 6.0        | 750                       | 21.4 | 15.8 | 0.74              | 0.96 | 25.4 | 26.0 | 750                       | 22.0         | 1.28         | 17.6       | 97.1         | 5.0        |
|            | 2.8        | 0.3           | 0.7        | 550                       | 19.6 | 13.4 | 0.68              | 1.11 | 23.4 | 17.7 | 550                       | 22.1         | 1.40         | 17.3       | 107.2        | 4.6        |
| 80         | 2.8        | 0.3           | 0.7        | 750                       | 20.4 | 15.6 | 0.76              | 1.17 | 24.4 | 17.4 | 750                       | 22.8         | 1.29         | 18.4       | 98.2         | 5.2        |
|            | 4.1        | 1.4           | 3.2        | 550                       | 20.3 | 13.5 | 0.67              | 1.04 | 23.8 | 19.5 | 550                       | 23.2         | 1.42         | 18.3       | 109.0        | 4.8        |
|            | 4.1        | 1.4           | 3.2        | 750                       | 21.1 | 15.7 | 0.75              | 1.10 | 24.8 | 19.2 | 750                       | 23.9         | 1.31         | 19.4       | 99.5         | 5.3        |
|            | 5.5        | 2.4           | 5.5        | 550                       | 20.6 | 13.6 | 0.66              | 1.00 | 24.0 | 20.5 | 550                       | 23.8         | 1.43         | 18.8       | 110.0        | 4.9        |
|            | 5.5        | 2.4           | 5.5        | 750                       | 21.4 | 15.8 | 0.74              | 1.06 | 25.0 | 20.1 | 750                       | 24.5         | 1.32         | 20.0       | 100.2        | 5.4        |
| 85         | 2.8        | 0.2           | 0.5        | 550                       | 18.4 | 13.1 | 0.71              | 1.24 | 22.7 | 14.8 | 550                       | 24.3         | 1.45         | 19.3       | 111.0        | 4.9        |
|            | 2.8        | 0.2           | 0.5        | 750                       | 19.2 | 15.2 | 0.79              | 1.31 | 23.6 | 14.6 | 750                       | 25.1         | 1.34         | 20.5       | 101.0        | 5.5        |
|            | 4.1        | 1.2           | 2.8        | 550                       | 19.1 | 13.3 | 0.69              | 1.16 | 23.1 | 16.5 | 550                       | 25.5         | 1.49         | 20.3       | 112.9        | 5.0        |
|            | 4.1        | 1.2           | 2.8        | 750                       | 19.9 | 15.4 | 0.78              | 1.23 | 24.1 | 16.2 | 750                       | 26.3         | 1.38         | 21.5       | 102.4        | 5.6        |
|            | 5.5        | 2.2           | 5.1        | 550                       | 19.5 | 13.4 | 0.69              | 1.12 | 23.3 | 17.3 | 550                       | 26.0         | 1.52         | 20.7       | 113.8        | 5.0        |
| 90         | 5.5        | 2.2           | 5.1        | 750                       | 20.3 | 15.5 | 0.77              | 1.19 | 24.3 | 17.0 | 750                       | 26.8         | 1.40         | 22.0       | 103.1        | 5.6        |
|            | 2.8        | 0.2           | 0.5        | 550                       | 17.8 | 12.9 | 0.72              | 1.32 | 22.3 | 13.5 | 550                       | 25.4         | 1.49         | 20.2       | 112.7        | 5.0        |
|            | 2.8        | 0.2           | 0.5        | 750                       | 18.5 | 15.0 | 0.81              | 1.40 | 23.3 | 13.3 | 750                       | 26.2         | 1.38         | 21.4       | 102.3        | 5.6        |
|            | 4.1        | 1.15          | 2.7        | 550                       | 18.5 | 13.1 | 0.71              | 1.24 | 22.7 | 15.1 | 550                       | 26.5         | 1.55         | 21.1       | 114.6        | 5.0        |
|            | 4.1        | 1.15          | 2.7        | 750                       | 19.2 | 15.2 | 0.79              | 1.31 | 23.7 | 14.8 | 750                       | 27.3         | 1.43         | 22.4       | 103.7        | 5.6        |
| 95         | 5.5        | 2.1           | 4.9        | 550                       | 18.9 | 13.2 | 0.70              | 1.20 | 22.9 | 15.9 | 550                       | 27.0         | 1.59         | 21.5       | 115.5        | 5.0        |
|            | 5.5        | 2.1           | 4.9        | 750                       | 19.6 | 15.3 | 0.78              | 1.26 | 23.9 | 15.6 | 750                       | 27.9         | 1.47         | 22.8       | 104.4        | 5.6        |
|            | 2.8        | 0.2           | 0.5        | 550                       | 17.2 | 12.7 | 0.74              | 1.40 | 21.9 | 12.3 | 550                       | 26.4         | 1.54         | 21.0       | 114.5        | 5.0        |
|            | 2.8        | 0.2           | 0.5        | 750                       | 17.8 | 14.8 | 0.83              | 1.48 | 22.9 | 12.1 | 750                       | 27.2         | 1.42         | 22.4       | 103.6        | 5.6        |
|            | 4.1        | 1.1           | 2.5        | 550                       | 17.9 | 12.9 | 0.72              | 1.31 | 22.3 | 13.7 | 550                       | 27.5         | 1.61         | 21.9       | 116.3        | 5.0        |
| 100        | 4.1        | 1.1           | 2.5        | 750                       | 18.6 | 15.0 | 0.81              | 1.38 | 23.3 | 13.4 | 750                       | 28.4         | 1.49         | 23.2       | 105.0        | 5.6        |
|            | 5.5        | 2.0           | 4.6        | 550                       | 18.2 | 13.0 | 0.71              | 1.27 | 22.6 | 14.4 | 550                       | 28.0         | 1.66         | 22.3       | 117.2        | 5.0        |
|            | 5.5        | 2.0           | 4.6        | 750                       | 19.0 | 15.2 | 0.80              | 1.54 | 23.5 | 14.2 | 750                       | 28.9         | 1.53         | 23.6       | 105.7        | 5.5        |
|            | 2.8        | 0.2           | 0.5        | 550                       | 15.9 | 12.3 | 0.77              | 1.58 | 21.3 | 10.1 | Operation Not Recommended |              |              |            |              |            |
|            | 2.8        | 0.2           | 0.5        | 750                       | 16.5 | 14.3 | 0.87              | 1.67 | 22.2 | 9.9  |                           |              |              |            |              |            |
| 110        | 4.1        | 1.1           | 2.5        | 550                       | 16.6 | 12.5 | 0.76              | 1.48 | 21.6 | 11.2 |                           |              |              |            |              |            |
|            | 4.1        | 1.1           | 2.5        | 750                       | 17.2 | 14.6 | 0.85              | 1.56 | 22.6 | 11.0 |                           |              |              |            |              |            |
|            | 5.5        | 1.9           | 4.4        | 550                       | 16.9 | 12.6 | 0.75              | 1.43 | 21.8 | 11.8 |                           |              |              |            |              |            |
|            | 5.5        | 1.9           | 4.4        | 750                       | 17.6 | 14.7 | 0.84              | 1.51 | 22.8 | 11.6 |                           |              |              |            |              |            |
|            | 2.8        | 0.1           | 0.2        | 550                       | 14.7 | 12.0 | 0.81              | 1.79 | 20.9 | 8.3  |                           |              |              |            |              |            |
| 120        | 2.8        | 0.1           | 0.2        | 750                       | 15.3 | 13.9 | 0.91              | 1.89 | 21.8 | 8.1  |                           |              |              |            |              |            |
|            | 4.1        | 0.9           | 2.1        | 550                       | 15.3 | 12.1 | 0.79              | 1.67 | 21.1 | 9.2  |                           |              |              |            |              |            |
|            | 4.1        | 0.9           | 2.1        | 750                       | 15.9 | 14.1 | 0.89              | 1.77 | 22.0 | 9.0  |                           |              |              |            |              |            |
|            | 5.5        | 1.7           | 3.9        | 550                       | 15.6 | 12.2 | 0.78              | 1.62 | 21.2 | 9.7  |                           |              |              |            |              |            |
|            | 5.5        | 1.7           | 3.9        | 750                       | 16.3 | 14.2 | 0.88              | 1.71 | 22.1 | 9.5  |                           |              |              |            |              |            |
| 130        | 2.8        | 0.1           | 0.2        | 550                       | 13.8 | 11.5 | 0.83              | 2.03 | 20.8 | 6.9  |                           |              |              |            |              |            |
|            | 2.8        | 0.1           | 0.2        | 750                       | 14.4 | 13.4 | 0.93              | 2.14 | 21.7 | 6.7  |                           |              |              |            |              |            |
|            | 4.1        | 0.8           | 1.8        | 550                       | 14.3 | 11.8 | 0.83              | 1.90 | 20.8 | 7.5  |                           |              |              |            |              |            |
|            | 4.1        | 0.8           | 1.8        | 750                       | 14.8 | 13.7 | 0.92              | 2.01 | 21.7 | 7.4  |                           |              |              |            |              |            |
|            | 5.5        | 1.6           | 3.7        | 550                       | 14.5 | 11.9 | 0.82              | 1.83 | 20.8 | 7.9  |                           |              |              |            |              |            |
| 140        | 5.5        | 1.6           | 3.7        | 750                       | 15.1 | 13.9 | 0.92              | 1.94 | 21.7 | 7.8  |                           |              |              |            |              |            |

#### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

#### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD024

## 850 CFM NOMINAL AIRFLOW COOLING/950 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|-----|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |     | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 8.0 | 5.6           | 12.9  | Operation Not Recommended |      |      |                   |      |      |      | 690                       | 16.0 | 1.70 | 10.6 | 92  | 2.76 |
|            | 8.0 | 5.6           | 12.9  |                           |      |      |                   |      |      |      | 950                       | 16.5 | 1.57 | 11.2 | 86  | 3.08 |
| 30         | 4.0 | 1.5           | 3.5   | 610                       | 28.1 | 16.1 | 0.57              | 0.78 | 30.6 | 35.9 | 690                       | 18.1 | 1.73 | 12.5 | 94  | 3.07 |
|            | 4.0 | 1.5           | 3.5   | 850                       | 29.2 | 18.7 | 0.64              | 0.83 | 31.9 | 35.3 | 950                       | 18.7 | 1.60 | 13.3 | 88  | 3.43 |
|            | 6.0 | 3.1           | 7.2   | 610                       | 28.1 | 16.1 | 0.57              | 0.76 | 30.6 | 37.1 | 690                       | 18.8 | 1.74 | 13.2 | 95  | 3.17 |
|            | 6.0 | 3.1           | 7.2   | 850                       | 29.3 | 18.7 | 0.64              | 0.80 | 31.9 | 36.5 | 950                       | 19.4 | 1.61 | 14.0 | 89  | 3.54 |
|            | 8.0 | 5.1           | 11.8  | 610                       | 28.2 | 16.1 | 0.57              | 0.74 | 30.7 | 38.1 | 690                       | 19.2 | 1.74 | 13.5 | 96  | 3.23 |
|            | 8.0 | 5.1           | 11.8  | 850                       | 29.3 | 18.8 | 0.64              | 0.78 | 32.0 | 37.5 | 950                       | 19.8 | 1.61 | 14.3 | 89  | 3.60 |
| 40         | 4.0 | 1.3           | 3.0   | 610                       | 28.4 | 16.6 | 0.58              | 0.89 | 31.3 | 31.9 | 690                       | 21.0 | 1.77 | 15.2 | 98  | 3.48 |
|            | 4.0 | 1.3           | 3.0   | 850                       | 29.5 | 19.3 | 0.65              | 0.94 | 32.7 | 31.3 | 950                       | 21.7 | 1.64 | 16.1 | 91  | 3.89 |
|            | 6.0 | 2.8           | 6.5   | 610                       | 28.6 | 16.6 | 0.58              | 0.84 | 31.4 | 34.1 | 690                       | 21.9 | 1.78 | 16.0 | 99  | 3.60 |
|            | 6.0 | 2.8           | 6.5   | 850                       | 29.7 | 19.3 | 0.65              | 0.89 | 32.7 | 33.5 | 950                       | 22.5 | 1.65 | 17.0 | 92  | 4.01 |
|            | 8.0 | 4.5           | 10.4  | 610                       | 28.7 | 16.6 | 0.58              | 0.82 | 31.4 | 35.2 | 690                       | 22.3 | 1.79 | 16.4 | 100 | 3.65 |
|            | 8.0 | 4.5           | 10.4  | 850                       | 29.9 | 19.3 | 0.65              | 0.86 | 32.8 | 34.6 | 950                       | 23.0 | 1.65 | 17.4 | 92  | 4.08 |
| 50         | 4.0 | 1.3           | 3.0   | 610                       | 28.2 | 16.7 | 0.59              | 1.00 | 31.5 | 28.1 | 690                       | 23.9 | 1.81 | 17.8 | 102 | 3.86 |
|            | 4.0 | 1.3           | 3.0   | 850                       | 29.3 | 19.4 | 0.66              | 1.06 | 32.9 | 27.7 | 950                       | 24.6 | 1.67 | 18.9 | 94  | 4.31 |
|            | 6.0 | 2.6           | 6.0   | 610                       | 28.5 | 16.8 | 0.59              | 0.94 | 31.6 | 30.4 | 690                       | 24.8 | 1.83 | 18.7 | 103 | 3.99 |
|            | 6.0 | 2.6           | 6.0   | 850                       | 29.7 | 19.5 | 0.66              | 0.99 | 33.0 | 29.8 | 950                       | 25.6 | 1.69 | 19.9 | 95  | 4.45 |
|            | 8.0 | 4.3           | 9.9   | 610                       | 28.6 | 16.8 | 0.59              | 0.91 | 31.7 | 31.5 | 690                       | 25.3 | 1.83 | 19.1 | 104 | 4.05 |
|            | 8.0 | 4.3           | 9.9   | 850                       | 29.8 | 19.5 | 0.66              | 0.96 | 33.0 | 30.9 | 950                       | 26.1 | 1.69 | 20.3 | 95  | 4.52 |
| 60         | 4.0 | 1.2           | 2.8   | 610                       | 27.3 | 16.4 | 0.60              | 1.13 | 31.1 | 24.1 | 690                       | 26.7 | 1.85 | 20.4 | 106 | 4.22 |
|            | 4.0 | 1.2           | 2.8   | 850                       | 28.4 | 19.1 | 0.67              | 1.20 | 32.5 | 23.7 | 950                       | 27.5 | 1.71 | 21.7 | 97  | 4.71 |
|            | 6.0 | 2.5           | 5.8   | 610                       | 27.8 | 16.6 | 0.60              | 1.06 | 31.4 | 26.3 | 690                       | 27.7 | 1.87 | 21.3 | 107 | 4.35 |
|            | 6.0 | 2.5           | 5.8   | 850                       | 28.9 | 19.3 | 0.67              | 1.12 | 32.7 | 25.8 | 950                       | 28.6 | 1.73 | 22.7 | 98  | 4.85 |
|            | 8.0 | 4.0           | 9.2   | 610                       | 28.1 | 16.7 | 0.59              | 1.02 | 31.5 | 27.4 | 690                       | 28.3 | 1.88 | 21.8 | 108 | 4.41 |
|            | 8.0 | 4.0           | 9.2   | 850                       | 29.2 | 19.4 | 0.67              | 1.08 | 32.8 | 26.9 | 950                       | 29.1 | 1.73 | 23.2 | 98  | 4.92 |
| 70         | 4.0 | 1.1           | 2.5   | 610                       | 26.1 | 16.0 | 0.61              | 1.28 | 30.5 | 20.4 | 690                       | 29.4 | 1.89 | 22.8 | 109 | 4.54 |
|            | 4.0 | 1.1           | 2.5   | 850                       | 27.2 | 18.7 | 0.69              | 1.36 | 31.8 | 20.0 | 950                       | 30.3 | 1.75 | 24.3 | 99  | 5.07 |
|            | 6.0 | 2.3           | 5.3   | 610                       | 26.8 | 16.3 | 0.61              | 1.20 | 30.8 | 22.3 | 690                       | 30.5 | 1.91 | 23.9 | 111 | 4.67 |
|            | 6.0 | 2.3           | 5.3   | 850                       | 27.9 | 18.9 | 0.68              | 1.27 | 32.2 | 22.0 | 950                       | 31.4 | 1.77 | 25.4 | 101 | 5.21 |
|            | 8.0 | 3.8           | 8.8   | 610                       | 27.1 | 16.4 | 0.60              | 1.16 | 31.0 | 23.4 | 690                       | 31.1 | 1.92 | 24.4 | 112 | 4.74 |
|            | 8.0 | 3.8           | 8.8   | 850                       | 28.2 | 19.1 | 0.68              | 1.23 | 32.3 | 23.0 | 950                       | 32.0 | 1.77 | 25.9 | 101 | 5.29 |
| 80         | 4.0 | 1.0           | 2.3   | 610                       | 24.8 | 15.6 | 0.63              | 1.45 | 29.7 | 17.1 | 690                       | 31.9 | 1.93 | 25.2 | 113 | 4.84 |
|            | 4.0 | 1.0           | 2.3   | 850                       | 25.8 | 18.1 | 0.70              | 1.54 | 31.0 | 16.8 | 950                       | 32.9 | 1.79 | 26.8 | 102 | 5.40 |
|            | 6.0 | 2.2           | 5.1   | 610                       | 25.5 | 15.8 | 0.62              | 1.36 | 30.1 | 18.7 | 690                       | 33.1 | 1.95 | 26.3 | 114 | 4.97 |
|            | 6.0 | 2.2           | 5.1   | 850                       | 26.5 | 18.4 | 0.69              | 1.44 | 31.4 | 18.4 | 950                       | 34.1 | 1.80 | 27.9 | 103 | 5.54 |
|            | 8.0 | 3.5           | 8.1   | 610                       | 25.9 | 15.9 | 0.62              | 1.32 | 30.3 | 19.6 | 690                       | 33.7 | 1.96 | 26.9 | 115 | 5.04 |
|            | 8.0 | 3.5           | 8.1   | 850                       | 26.9 | 18.6 | 0.69              | 1.39 | 31.6 | 19.3 | 950                       | 34.8 | 1.81 | 28.5 | 104 | 5.62 |
| 85         | 4.0 | 1.0           | 2.3   | 610                       | 24.0 | 15.3 | 0.64              | 1.55 | 29.3 | 15.5 | 690                       | 33.2 | 1.95 | 26.3 | 114 | 4.98 |
|            | 4.0 | 1.0           | 2.3   | 850                       | 25.0 | 17.8 | 0.71              | 1.64 | 30.6 | 15.2 | 950                       | 34.2 | 1.80 | 28.0 | 103 | 5.55 |
|            | 6.0 | 2.2           | 5.0   | 610                       | 24.8 | 15.6 | 0.63              | 1.45 | 29.7 | 17.0 | 690                       | 34.3 | 1.97 | 27.4 | 116 | 5.10 |
|            | 6.0 | 2.2           | 5.0   | 850                       | 25.8 | 18.1 | 0.70              | 1.54 | 31.0 | 16.8 | 950                       | 35.4 | 1.82 | 29.2 | 105 | 5.69 |
|            | 8.0 | 3.5           | 8.0   | 610                       | 25.1 | 15.7 | 0.62              | 1.41 | 29.9 | 17.9 | 690                       | 35.0 | 1.98 | 28.0 | 117 | 5.17 |
|            | 8.0 | 3.5           | 8.0   | 850                       | 26.1 | 18.3 | 0.70              | 1.49 | 31.2 | 17.6 | 950                       | 36.0 | 1.83 | 29.8 | 105 | 5.77 |
| 90         | 4.0 | 1.0           | 2.3   | 610                       | 23.3 | 15.0 | 0.65              | 1.65 | 28.9 | 14.1 | 690                       | 34.4 | 1.97 | 27.5 | 116 | 5.11 |
|            | 4.0 | 1.0           | 2.3   | 850                       | 24.2 | 17.5 | 0.72              | 1.74 | 30.2 | 13.9 | 950                       | 35.5 | 1.82 | 29.2 | 105 | 5.70 |
|            | 6.0 | 2.1           | 4.9   | 610                       | 24.0 | 15.3 | 0.64              | 1.55 | 29.3 | 15.6 | 690                       | 35.6 | 1.99 | 28.6 | 118 | 5.23 |
|            | 6.0 | 2.1           | 4.9   | 850                       | 25.0 | 17.8 | 0.71              | 1.63 | 30.6 | 15.3 | 950                       | 36.7 | 1.84 | 30.4 | 106 | 5.84 |
|            | 8.0 | 3.4           | 7.9   | 610                       | 24.4 | 15.4 | 0.63              | 1.50 | 29.5 | 16.3 | 690                       | 36.2 | 2.00 | 29.1 | 119 | 5.30 |
|            | 8.0 | 3.4           | 7.9   | 850                       | 25.4 | 18.0 | 0.71              | 1.58 | 30.8 | 16.0 | 950                       | 37.3 | 1.85 | 31.0 | 106 | 5.91 |
| 100        | 4.0 | 1.0           | 2.3   | 610                       | 21.8 | 14.5 | 0.67              | 1.86 | 28.2 | 11.7 | Operation Not Recommended |      |      |      |     |      |
|            | 4.0 | 1.0           | 2.3   | 850                       | 22.6 | 16.9 | 0.75              | 1.97 | 29.4 | 11.5 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 610                       | 22.5 | 14.8 | 0.66              | 1.75 | 28.5 | 12.8 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 850                       | 23.4 | 17.2 | 0.73              | 1.86 | 29.7 | 12.6 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 610                       | 22.9 | 14.9 | 0.65              | 1.70 | 28.7 | 13.5 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 850                       | 23.8 | 17.3 | 0.73              | 1.80 | 29.9 | 13.2 |                           |      |      |      |     |      |
| 110        | 4.0 | 0.9           | 2.1   | 610                       | 20.3 | 14.1 | 0.69              | 2.11 | 27.5 | 9.6  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 850                       | 21.1 | 16.4 | 0.78              | 2.23 | 28.7 | 9.4  |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 610                       | 21.0 | 14.3 | 0.68              | 1.99 | 27.8 | 10.5 |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 850                       | 21.8 | 16.6 | 0.76              | 2.10 | 29.0 | 10.4 |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 610                       | 21.3 | 14.4 | 0.67              | 1.93 | 28.0 | 11.1 |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 850                       | 22.2 | 16.7 | 0.75              | 2.04 | 29.2 | 10.9 |                           |      |      |      |     |      |
| 120        | 4.0 | 0.9           | 2.1   | 610                       | 18.9 | 13.7 | 0.73              | 2.39 | 27.1 | 7.9  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 850                       | 19.7 | 16.0 | 0.81              | 2.52 | 28.3 | 7.8  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 610                       | 19.5 | 13.9 | 0.71              | 2.25 | 27.3 | 8.7  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 850                       | 20.3 | 16.2 | 0.80              | 2.38 | 28.5 | 8.5  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 610                       | 19.9 | 14.0 | 0.70              | 2.19 | 27.4 | 9.1  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 850                       | 20.6 | 16.3 | 0.79              | 2.31 | 28.6 | 8.9  |                           |      |      |      |     |      |

### LEGEND

|       |   |   |
|-------|---|---|
| AHRI  | — | Air Conditioning, Heating and Refrigeration Institute |
| COP   | — | Coefficient of Performance                            |
| db    | — | Dry Bulb  |
| EER   | — | Energy Efficiency Ratio                               |
| EWT   | — | Entering Water Temperature                            |
| GPM   | — | Gallons Per Minute                                    |
| HE    | — | Heat of Extraction (MBtuh)                            |
| ISO   | — | International Organization for Standardization        |
| LAT   | — | Leaving Air Temperature (F)                           |
| MBtuh | — | Btuh in Thousands                                     |
| TC    | — | Total Capacity (MBtuh)                                |
| THC   | — | Total Heating Capacity (MBtuh)                        |
| THR   | — | Total Heat Rejection (MBtuh)                          |
| TSC   | — | Total Sensible Capacity (MBtuh)                       |
| wb    | — | Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD030

1,000 CFM NOMINAL AIRFLOW COOLING/1,100 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|-----|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |     | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 8.0 | 5.6           | 12.9  | Operation Not Recommended |      |      |                   |      |      |      | 820                       | 19.8 | 2.03 | 13.3 | 92  | 2.86 |
|            | 8.0 | 5.6           | 12.9  |                           |      |      |                   |      |      |      | 1100                      | 20.4 | 1.88 | 14.1 | 87  | 3.19 |
| 30         | 4.0 | 1.5           | 3.5   | 730                       | 29.1 | 17.0 | 0.58              | 1.13 | 32.9 | 25.8 | 820                       | 21.8 | 2.05 | 15.1 | 95  | 3.12 |
|            | 4.0 | 1.5           | 3.5   | 1000                      | 30.2 | 19.8 | 0.65              | 1.19 | 34.3 | 25.3 | 1100                      | 22.5 | 1.89 | 16.1 | 89  | 3.48 |
|            | 6.0 | 3.1           | 7.2   | 730                       | 29.3 | 17.0 | 0.58              | 1.07 | 32.9 | 27.3 | 820                       | 22.7 | 2.06 | 16.0 | 96  | 3.23 |
|            | 6.0 | 3.1           | 7.2   | 1000                      | 30.5 | 19.8 | 0.65              | 1.14 | 34.3 | 26.8 | 1100                      | 23.4 | 1.90 | 17.0 | 90  | 3.60 |
|            | 8.0 | 5.1           | 11.8  | 730                       | 29.6 | 17.2 | 0.58              | 1.05 | 33.1 | 28.3 | 820                       | 23.2 | 2.07 | 16.4 | 96  | 3.29 |
|            | 8.0 | 5.1           | 11.8  | 1000                      | 30.7 | 20.0 | 0.65              | 1.11 | 34.5 | 27.8 | 1100                      | 23.9 | 1.91 | 17.4 | 90  | 3.67 |
| 40         | 4.0 | 1.3           | 3.0   | 730                       | 32.2 | 19.1 | 0.59              | 1.26 | 36.4 | 25.6 | 820                       | 24.9 | 2.09 | 18.0 | 98  | 3.49 |
|            | 4.0 | 1.3           | 3.0   | 1000                      | 33.5 | 22.2 | 0.66              | 1.33 | 38.0 | 25.1 | 1100                      | 25.6 | 1.93 | 19.1 | 92  | 3.90 |
|            | 6.0 | 2.8           | 6.5   | 730                       | 32.6 | 19.2 | 0.59              | 1.19 | 36.6 | 27.5 | 820                       | 25.9 | 2.10 | 18.9 | 99  | 3.61 |
|            | 6.0 | 2.8           | 6.5   | 1000                      | 33.9 | 22.3 | 0.66              | 1.26 | 38.2 | 27.0 | 1100                      | 26.7 | 1.94 | 20.1 | 92  | 4.03 |
|            | 8.0 | 4.5           | 10.4  | 730                       | 33.1 | 19.4 | 0.59              | 1.16 | 37.0 | 28.7 | 820                       | 26.4 | 2.11 | 19.4 | 100 | 3.67 |
|            | 8.0 | 4.5           | 10.4  | 1000                      | 34.4 | 22.6 | 0.66              | 1.22 | 38.6 | 28.2 | 1100                      | 27.2 | 1.95 | 20.6 | 93  | 4.10 |
| 50         | 4.0 | 1.3           | 3.0   | 730                       | 32.3 | 19.3 | 0.60              | 1.39 | 36.9 | 23.2 | 820                       | 27.8 | 2.13 | 20.7 | 101 | 3.83 |
|            | 4.0 | 1.3           | 3.0   | 1000                      | 33.5 | 22.4 | 0.67              | 1.47 | 38.5 | 22.8 | 1100                      | 28.7 | 1.97 | 22.0 | 94  | 4.27 |
|            | 6.0 | 2.6           | 6.0   | 730                       | 32.7 | 19.4 | 0.59              | 1.31 | 37.1 | 25.0 | 820                       | 29.0 | 2.15 | 21.8 | 103 | 3.96 |
|            | 6.0 | 2.6           | 6.0   | 1000                      | 34.0 | 22.6 | 0.67              | 1.38 | 38.7 | 24.6 | 1100                      | 29.9 | 1.99 | 23.1 | 95  | 4.41 |
|            | 8.0 | 4.3           | 9.9   | 730                       | 33.1 | 19.6 | 0.59              | 1.27 | 37.4 | 26.1 | 820                       | 29.6 | 2.16 | 22.3 | 103 | 4.02 |
|            | 8.0 | 4.3           | 9.9   | 1000                      | 34.5 | 22.9 | 0.66              | 1.34 | 39.0 | 25.7 | 1100                      | 30.5 | 2.00 | 23.7 | 96  | 4.49 |
| 60         | 4.0 | 1.2           | 2.8   | 730                       | 31.9 | 19.5 | 0.61              | 1.53 | 37.1 | 20.8 | 820                       | 30.8 | 2.18 | 23.4 | 105 | 4.14 |
|            | 4.0 | 1.2           | 2.8   | 1000                      | 33.1 | 22.7 | 0.68              | 1.62 | 38.7 | 20.4 | 1100                      | 31.8 | 2.01 | 24.9 | 97  | 4.62 |
|            | 6.0 | 2.5           | 5.8   | 730                       | 32.6 | 19.7 | 0.60              | 1.44 | 37.5 | 22.7 | 820                       | 32.1 | 2.20 | 24.6 | 106 | 4.27 |
|            | 6.0 | 2.5           | 5.8   | 1000                      | 33.9 | 22.9 | 0.68              | 1.52 | 39.1 | 22.3 | 1100                      | 33.1 | 2.04 | 26.2 | 98  | 4.77 |
|            | 8.0 | 4.0           | 9.2   | 730                       | 32.9 | 19.8 | 0.60              | 1.40 | 37.6 | 23.6 | 820                       | 32.8 | 2.22 | 25.3 | 107 | 4.34 |
|            | 8.0 | 4.0           | 9.2   | 1000                      | 34.2 | 23.0 | 0.67              | 1.48 | 39.2 | 23.2 | 1100                      | 33.8 | 2.05 | 26.8 | 98  | 4.84 |
| 70         | 4.0 | 1.1           | 2.5   | 730                       | 30.3 | 18.9 | 0.62              | 1.69 | 36.0 | 17.9 | 820                       | 33.8 | 2.23 | 26.1 | 108 | 4.43 |
|            | 4.0 | 1.1           | 2.5   | 1000                      | 31.5 | 22.0 | 0.70              | 1.79 | 37.6 | 17.6 | 1100                      | 34.8 | 2.06 | 27.8 | 99  | 4.94 |
|            | 6.0 | 2.3           | 5.3   | 730                       | 31.3 | 19.3 | 0.62              | 1.59 | 36.7 | 19.7 | 820                       | 35.2 | 2.26 | 27.5 | 110 | 4.57 |
|            | 6.0 | 2.3           | 5.3   | 1000                      | 32.6 | 22.4 | 0.69              | 1.68 | 38.3 | 19.4 | 1100                      | 36.3 | 2.09 | 29.2 | 101 | 5.10 |
|            | 8.0 | 3.8           | 8.8   | 730                       | 31.8 | 19.5 | 0.61              | 1.54 | 37.0 | 20.7 | 820                       | 36.0 | 2.28 | 28.2 | 111 | 4.64 |
|            | 8.0 | 3.8           | 8.8   | 1000                      | 33.1 | 22.6 | 0.68              | 1.63 | 38.6 | 20.3 | 1100                      | 37.1 | 2.10 | 30.0 | 101 | 5.18 |
| 80         | 4.0 | 1.0           | 2.3   | 730                       | 28.4 | 18.1 | 0.64              | 1.87 | 34.8 | 15.2 | 820                       | 36.8 | 2.29 | 28.9 | 112 | 4.71 |
|            | 4.0 | 1.0           | 2.3   | 1000                      | 29.6 | 21.1 | 0.71              | 1.98 | 36.3 | 15.0 | 1100                      | 37.9 | 2.12 | 30.7 | 102 | 5.25 |
|            | 6.0 | 2.2           | 5.1   | 730                       | 29.6 | 18.6 | 0.63              | 1.76 | 35.6 | 16.9 | 820                       | 38.4 | 2.32 | 30.4 | 113 | 4.85 |
|            | 6.0 | 2.2           | 5.1   | 1000                      | 30.8 | 21.7 | 0.70              | 1.86 | 37.1 | 16.6 | 1100                      | 39.6 | 2.14 | 32.3 | 103 | 5.41 |
|            | 8.0 | 3.5           | 8.1   | 730                       | 30.2 | 18.8 | 0.62              | 1.70 | 36.0 | 17.7 | 820                       | 39.3 | 2.34 | 31.2 | 114 | 4.93 |
|            | 8.0 | 3.5           | 8.1   | 1000                      | 31.4 | 21.9 | 0.70              | 1.80 | 37.5 | 17.4 | 1100                      | 40.5 | 2.16 | 33.1 | 104 | 5.50 |
| 85         | 4.0 | 1.0           | 2.3   | 730                       | 27.5 | 17.8 | 0.65              | 1.97 | 34.2 | 13.9 | 820                       | 38.3 | 2.32 | 30.3 | 113 | 4.84 |
|            | 4.0 | 1.0           | 2.3   | 1000                      | 28.6 | 20.7 | 0.72              | 2.08 | 35.7 | 13.7 | 1100                      | 39.5 | 2.14 | 32.1 | 103 | 5.40 |
|            | 6.0 | 2.2           | 5.0   | 730                       | 28.6 | 18.2 | 0.64              | 1.85 | 34.9 | 15.4 | 820                       | 40.1 | 2.35 | 31.9 | 115 | 5.00 |
|            | 6.0 | 2.2           | 5.0   | 1000                      | 29.8 | 21.2 | 0.71              | 1.96 | 36.4 | 15.2 | 1100                      | 41.3 | 2.17 | 33.9 | 105 | 5.58 |
|            | 8.0 | 3.5           | 8.0   | 730                       | 29.2 | 18.5 | 0.63              | 1.80 | 35.3 | 16.3 | 820                       | 41.0 | 2.37 | 32.7 | 116 | 5.08 |
|            | 8.0 | 3.5           | 8.0   | 1000                      | 30.4 | 21.5 | 0.71              | 1.90 | 36.8 | 16.0 | 1100                      | 42.3 | 2.19 | 34.8 | 106 | 5.67 |
| 90         | 4.0 | 1.0           | 2.3   | 730                       | 26.5 | 17.4 | 0.66              | 2.07 | 33.6 | 12.8 | 820                       | 39.8 | 2.35 | 31.6 | 115 | 4.98 |
|            | 4.0 | 1.0           | 2.3   | 1000                      | 27.5 | 20.2 | 0.73              | 2.19 | 35.0 | 12.6 | 1100                      | 41.1 | 2.17 | 33.6 | 105 | 5.55 |
|            | 6.0 | 2.1           | 4.9   | 730                       | 27.6 | 17.8 | 0.65              | 1.95 | 34.3 | 14.2 | 820                       | 41.7 | 2.38 | 33.4 | 117 | 5.14 |
|            | 6.0 | 2.1           | 4.9   | 1000                      | 28.7 | 20.7 | 0.72              | 2.06 | 35.8 | 13.9 | 1100                      | 43.0 | 2.20 | 35.5 | 106 | 5.73 |
|            | 8.0 | 3.4           | 7.9   | 730                       | 28.2 | 18.1 | 0.64              | 1.89 | 34.7 | 14.9 | 820                       | 42.7 | 2.40 | 34.3 | 118 | 5.23 |
|            | 8.0 | 3.4           | 7.9   | 1000                      | 29.4 | 21.0 | 0.72              | 2.00 | 36.2 | 14.7 | 1100                      | 44.1 | 2.21 | 36.5 | 107 | 5.83 |
| 100        | 4.0 | 1.0           | 2.3   | 730                       | 24.7 | 16.7 | 0.68              | 2.31 | 32.6 | 10.7 | Operation Not Recommended |      |      |      |     |      |
|            | 4.0 | 1.0           | 2.3   | 1000                      | 25.7 | 19.5 | 0.76              | 2.44 | 34.0 | 10.5 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 730                       | 25.7 | 17.1 | 0.67              | 2.17 | 33.1 | 11.8 |                           |      |      |      |     |      |
|            | 6.0 | 2.0           | 4.6   | 1000                      | 26.7 | 19.9 | 0.74              | 2.30 | 34.6 | 11.6 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 730                       | 26.2 | 17.3 | 0.66              | 2.10 | 33.4 | 12.5 |                           |      |      |      |     |      |
|            | 8.0 | 3.2           | 7.4   | 1000                      | 27.3 | 20.1 | 0.74              | 2.23 | 34.9 | 12.3 |                           |      |      |      |     |      |
| 110        | 4.0 | 0.9           | 2.1   | 730                       | 23.2 | 16.4 | 0.70              | 2.59 | 32.1 | 9.0  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 1000                      | 24.1 | 19.0 | 0.79              | 2.74 | 33.5 | 8.8  |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 730                       | 24.0 | 16.5 | 0.69              | 2.43 | 32.3 | 9.9  |                           |      |      |      |     |      |
|            | 6.0 | 1.9           | 4.4   | 1000                      | 24.9 | 19.2 | 0.77              | 2.57 | 33.7 | 9.7  |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 730                       | 24.4 | 16.6 | 0.68              | 2.35 | 32.5 | 10.4 |                           |      |      |      |     |      |
|            | 8.0 | 3.1           | 7.2   | 1000                      | 25.4 | 19.4 | 0.76              | 2.49 | 33.9 | 10.2 |                           |      |      |      |     |      |
| 120        | 4.0 | 0.9           | 2.1   | 730                       | 22.0 | 16.1 | 0.73              | 2.87 | 31.9 | 7.7  |                           |      |      |      |     |      |
|            | 4.0 | 0.9           | 2.1   | 1000                      | 22.8 | 18.7 | 0.82              | 3.04 | 33.2 | 7.5  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 730                       | 22.5 | 16.1 | 0.72              | 2.74 | 31.9 | 8.2  |                           |      |      |      |     |      |
|            | 6.0 | 1.8           | 4.2   | 1000                      | 23.4 | 18.8 | 0.80              | 2.90 | 33.3 | 8.1  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 730                       | 22.7 | 16.2 | 0.71              | 2.67 | 31.9 | 8.5  |                           |      |      |      |     |      |
|            | 8.0 | 3.0           | 6.9   | 1000                      | 23.6 | 18.9 | 0.80              | 2.82 | 33.3 | 8.4  |                           |      |      |      |     |      |

### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD036

## 1,250 CFM NOMINAL AIRFLOW COOLING/1,250 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM        | PRESSURE DROP |              | COOLING                   |      |      |                   |      |      |      | HEATING                   |              |              |              |          |              |
|------------|------------|---------------|--------------|---------------------------|------|------|-------------------|------|------|------|---------------------------|--------------|--------------|--------------|----------|--------------|
|            |            | PSI           | ft wg        | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC          | kW           | HE           | LAT      | COP          |
| 20         | 9.0<br>9.0 | 5.9<br>5.9    | 13.6<br>13.6 | Operation Not Recommended |      |      |                   |      |      |      | 900<br>1250               | 21.5<br>22.1 | 2.06<br>1.90 | 14.8<br>15.7 | 92<br>86 | 3.06<br>3.42 |
| 30         | 4.5        | 1.7           | 3.9          | 900                       | 33.0 | 19.5 | 0.59              | 1.16 | 36.9 | 28.5 | 900                       | 23.7         | 2.09         | 16.9         | 94       | 3.33         |
|            | 4.5        | 1.7           | 3.9          | 1250                      | 34.3 | 22.7 | 0.66              | 1.22 | 38.4 | 28.0 | 1250                      | 24.5         | 1.93         | 17.9         | 88       | 3.72         |
|            | 6.8        | 3.3           | 7.6          | 900                       | 33.1 | 19.5 | 0.59              | 1.13 | 36.9 | 29.4 | 900                       | 24.7         | 2.10         | 17.8         | 95       | 3.45         |
|            | 6.8        | 3.3           | 7.6          | 1250                      | 34.4 | 22.7 | 0.66              | 1.19 | 38.4 | 28.9 | 1250                      | 25.5         | 1.94         | 18.9         | 89       | 3.84         |
|            | 9.0        | 5.7           | 13.2         | 900                       | 33.3 | 19.6 | 0.59              | 1.10 | 36.9 | 30.3 | 900                       | 25.3         | 2.11         | 18.3         | 96       | 3.51         |
|            | 9.0        | 5.7           | 13.2         | 1250                      | 34.6 | 22.8 | 0.66              | 1.16 | 38.5 | 29.8 | 1250                      | 26.1         | 1.95         | 19.4         | 89       | 3.91         |
| 40         | 4.5        | 1.5           | 3.5          | 900                       | 36.1 | 22.4 | 0.62              | 1.29 | 40.4 | 28.1 | 900                       | 27.3         | 2.14         | 20.1         | 98       | 3.73         |
|            | 4.5        | 1.5           | 3.5          | 1250                      | 37.5 | 26.1 | 0.69              | 1.36 | 42.2 | 27.6 | 1250                      | 28.1         | 1.98         | 21.4         | 91       | 4.17         |
|            | 6.8        | 3.2           | 7.4          | 900                       | 36.3 | 22.4 | 0.62              | 1.24 | 40.5 | 29.2 | 900                       | 28.5         | 2.16         | 21.3         | 99       | 3.87         |
|            | 6.8        | 3.2           | 7.4          | 1250                      | 37.7 | 26.1 | 0.69              | 1.32 | 42.2 | 28.7 | 1250                      | 29.4         | 2.00         | 22.6         | 92       | 4.32         |
|            | 9.0        | 5.4           | 12.5         | 900                       | 36.7 | 22.5 | 0.61              | 1.21 | 40.7 | 30.3 | 900                       | 29.2         | 2.17         | 21.9         | 100      | 3.94         |
|            | 9.0        | 5.4           | 12.5         | 1250                      | 38.1 | 26.2 | 0.69              | 1.28 | 42.4 | 29.8 | 1250                      | 30.1         | 2.01         | 23.3         | 92       | 4.40         |
| 50         | 4.5        | 1.3           | 3.0          | 900                       | 37.1 | 23.9 | 0.64              | 1.42 | 41.9 | 26.1 | 900                       | 30.9         | 2.20         | 23.5         | 102      | 4.12         |
|            | 4.5        | 1.3           | 3.0          | 1250                      | 38.6 | 27.9 | 0.72              | 1.51 | 43.7 | 25.6 | 1250                      | 31.9         | 2.03         | 25.0         | 94       | 4.60         |
|            | 6.8        | 3.1           | 7.2          | 900                       | 37.4 | 23.8 | 0.64              | 1.37 | 42.0 | 27.3 | 900                       | 32.4         | 2.22         | 24.8         | 103      | 4.27         |
|            | 6.8        | 3.1           | 7.2          | 1250                      | 38.9 | 27.7 | 0.71              | 1.45 | 43.8 | 26.9 | 1250                      | 33.4         | 2.05         | 26.4         | 95       | 4.77         |
|            | 9.0        | 5.2           | 12.0         | 900                       | 37.6 | 23.8 | 0.63              | 1.33 | 42.1 | 28.3 | 900                       | 33.2         | 2.23         | 25.6         | 104      | 4.35         |
|            | 9.0        | 5.2           | 12.0         | 1250                      | 39.1 | 27.6 | 0.71              | 1.41 | 43.9 | 27.8 | 1250                      | 34.2         | 2.06         | 27.2         | 95       | 4.85         |
| 60         | 4.5        | 1.2           | 2.8          | 900                       | 36.3 | 23.8 | 0.66              | 1.60 | 41.7 | 22.7 | 900                       | 34.6         | 2.26         | 26.9         | 106      | 4.49         |
|            | 4.5        | 1.2           | 2.8          | 1250                      | 37.8 | 27.7 | 0.73              | 1.69 | 43.5 | 22.4 | 1250                      | 35.7         | 2.09         | 28.6         | 96       | 5.01         |
|            | 6.8        | 2.9           | 6.7          | 900                       | 37.1 | 24.1 | 0.65              | 1.50 | 42.1 | 24.7 | 900                       | 36.3         | 2.29         | 28.4         | 107      | 4.65         |
|            | 6.8        | 2.9           | 6.7          | 1250                      | 38.5 | 28.0 | 0.73              | 1.59 | 43.9 | 24.2 | 1250                      | 37.4         | 2.11         | 30.2         | 98       | 5.19         |
|            | 9.0        | 5.0           | 11.6         | 900                       | 37.3 | 24.1 | 0.65              | 1.46 | 42.2 | 25.6 | 900                       | 37.2         | 2.30         | 29.3         | 108      | 4.74         |
|            | 9.0        | 5.0           | 11.6         | 1250                      | 38.8 | 28.0 | 0.72              | 1.54 | 44.0 | 25.1 | 1250                      | 38.4         | 2.13         | 31.1         | 98       | 5.29         |
| 70         | 4.5        | 1.1           | 2.5          | 900                       | 34.6 | 23.1 | 0.67              | 1.76 | 40.6 | 19.7 | 900                       | 38.3         | 2.32         | 30.3         | 109      | 4.84         |
|            | 4.5        | 1.1           | 2.5          | 1250                      | 36.0 | 26.9 | 0.75              | 1.86 | 42.3 | 19.4 | 1250                      | 39.5         | 2.15         | 32.2         | 99       | 5.40         |
|            | 6.8        | 2.9           | 6.7          | 900                       | 35.8 | 23.6 | 0.66              | 1.65 | 41.4 | 21.6 | 900                       | 40.2         | 2.35         | 32.0         | 111      | 5.01         |
|            | 6.8        | 2.9           | 6.7          | 1250                      | 37.2 | 27.5 | 0.74              | 1.75 | 43.1 | 21.3 | 1250                      | 41.5         | 2.18         | 34.0         | 101      | 5.58         |
|            | 9.0        | 4.8           | 11.1         | 900                       | 36.3 | 23.8 | 0.66              | 1.60 | 41.7 | 22.6 | 900                       | 41.2         | 2.37         | 32.9         | 112      | 5.09         |
|            | 9.0        | 4.8           | 11.1         | 1250                      | 37.7 | 27.7 | 0.73              | 1.70 | 43.5 | 22.2 | 1250                      | 42.5         | 2.19         | 35.0         | 101      | 5.68         |
| 80         | 4.5        | 1.0           | 2.3          | 900                       | 32.5 | 22.1 | 0.68              | 1.94 | 39.1 | 16.8 | 900                       | 42.0         | 2.39         | 33.6         | 113      | 5.16         |
|            | 4.5        | 1.0           | 2.3          | 1250                      | 33.8 | 25.7 | 0.76              | 2.05 | 40.8 | 16.5 | 1250                      | 43.3         | 2.21         | 35.8         | 102      | 5.75         |
|            | 6.8        | 2.8           | 6.5          | 900                       | 33.9 | 22.7 | 0.67              | 1.82 | 40.0 | 18.6 | 900                       | 44.1         | 2.43         | 35.5         | 115      | 5.33         |
|            | 6.8        | 2.8           | 6.5          | 1250                      | 35.2 | 26.4 | 0.75              | 1.93 | 41.8 | 18.2 | 1250                      | 45.5         | 2.24         | 37.8         | 104      | 5.94         |
|            | 9.0        | 4.5           | 10.4         | 900                       | 34.5 | 23.0 | 0.67              | 1.77 | 40.5 | 19.5 | 900                       | 45.2         | 2.45         | 36.5         | 117      | 5.41         |
|            | 9.0        | 4.5           | 10.4         | 1250                      | 35.9 | 26.8 | 0.75              | 1.87 | 42.2 | 19.2 | 1250                      | 46.6         | 2.26         | 38.8         | 105      | 6.04         |
| 85         | 4.5        | 1.0           | 2.2          | 900                       | 31.4 | 21.5 | 0.69              | 2.04 | 38.4 | 15.4 | 900                       | 43.9         | 2.42         | 35.3         | 115      | 5.30         |
|            | 4.5        | 1.0           | 2.2          | 1250                      | 32.7 | 25.1 | 0.77              | 2.16 | 40.0 | 15.1 | 1250                      | 45.2         | 2.24         | 37.5         | 103      | 5.92         |
|            | 6.8        | 2.7           | 6.2          | 900                       | 32.7 | 22.2 | 0.68              | 1.92 | 39.3 | 17.0 | 900                       | 46.0         | 2.47         | 37.3         | 117      | 5.47         |
|            | 6.8        | 2.7           | 6.2          | 1250                      | 34.0 | 25.8 | 0.76              | 2.03 | 41.0 | 16.7 | 1250                      | 47.4         | 2.28         | 39.6         | 105      | 6.10         |
|            | 9.0        | 4.5           | 10.3         | 900                       | 33.4 | 22.5 | 0.67              | 1.86 | 39.7 | 17.9 | 900                       | 47.2         | 2.49         | 38.3         | 119      | 5.55         |
|            | 9.0        | 4.5           | 10.3         | 1250                      | 34.7 | 26.2 | 0.75              | 1.97 | 41.4 | 17.6 | 1250                      | 48.6         | 2.30         | 40.7         | 106      | 6.20         |
| 90         | 4.5        | 0.9           | 2.1          | 900                       | 30.3 | 21.0 | 0.69              | 2.14 | 37.6 | 14.1 | 900                       | 45.7         | 2.46         | 37.0         | 117      | 5.45         |
|            | 4.5        | 0.9           | 2.1          | 1250                      | 31.5 | 24.4 | 0.78              | 2.27 | 39.2 | 13.9 | 1250                      | 47.1         | 2.27         | 39.3         | 105      | 6.08         |
|            | 6.8        | 2.6           | 6.0          | 900                       | 31.6 | 21.6 | 0.68              | 2.02 | 38.5 | 15.7 | 900                       | 47.9         | 2.50         | 39.0         | 119      | 5.61         |
|            | 6.8        | 2.6           | 6.0          | 1250                      | 32.9 | 25.2 | 0.77              | 2.14 | 40.2 | 15.4 | 1250                      | 49.4         | 2.31         | 41.4         | 107      | 6.26         |
|            | 9.0        | 4.4           | 10.2         | 900                       | 32.3 | 22.0 | 0.68              | 1.96 | 39.0 | 16.5 | 900                       | 49.1         | 2.53         | 40.1         | 121      | 5.69         |
|            | 9.0        | 4.4           | 10.2         | 1250                      | 33.6 | 25.5 | 0.76              | 2.07 | 40.7 | 16.2 | 1250                      | 50.6         | 2.34         | 42.6         | 108      | 6.35         |
| 100        | 4.5        | 0.8           | 1.8          | 900                       | 28.2 | 20.1 | 0.71              | 2.38 | 36.3 | 11.8 | Operation Not Recommended |              |              |              |          |              |
|            | 4.5        | 0.8           | 1.8          | 1250                      | 29.3 | 23.4 | 0.80              | 2.52 | 37.9 | 11.6 |                           |              |              |              |          |              |
|            | 6.8        | 2.6           | 6.0          | 900                       | 29.3 | 20.6 | 0.70              | 2.24 | 37.0 | 13.1 |                           |              |              |              |          |              |
|            | 6.8        | 2.6           | 6.0          | 1250                      | 30.5 | 23.9 | 0.78              | 2.37 | 38.6 | 12.9 |                           |              |              |              |          |              |
|            | 9.0        | 4.2           | 9.7          | 900                       | 30.0 | 20.9 | 0.70              | 2.18 | 37.4 | 13.8 |                           |              |              |              |          |              |
|            | 9.0        | 4.2           | 9.7          | 1250                      | 31.2 | 24.3 | 0.78              | 2.30 | 39.0 | 13.5 |                           |              |              |              |          |              |
| 110        | 4.5        | 0.8           | 1.8          | 900                       | 26.4 | 19.6 | 0.74              | 2.66 | 35.5 | 9.9  |                           |              |              |              |          |              |
|            | 4.5        | 0.8           | 1.8          | 1250                      | 27.4 | 22.8 | 0.83              | 2.82 | 37.1 | 9.7  |                           |              |              |              |          |              |
|            | 6.8        | 2.5           | 5.8          | 900                       | 27.3 | 19.8 | 0.72              | 2.50 | 35.9 | 10.9 |                           |              |              |              |          |              |
|            | 6.8        | 2.5           | 5.8          | 1250                      | 28.4 | 23.0 | 0.81              | 2.65 | 37.4 | 10.7 |                           |              |              |              |          |              |
|            | 9.0        | 4.0           | 9.2          | 900                       | 27.8 | 20.0 | 0.72              | 2.43 | 36.1 | 11.5 |                           |              |              |              |          |              |
|            | 9.0        | 4.0           | 9.2          | 1250                      | 28.9 | 23.2 | 0.80              | 2.57 | 37.7 | 11.3 |                           |              |              |              |          |              |
| 120        | 4.5        | 0.7           | 1.6          | 900                       | 25.1 | 19.3 | 0.77              | 2.98 | 35.3 | 8.4  |                           |              |              |              |          |              |
|            | 4.5        | 0.7           | 1.6          | 1250                      | 26.1 | 22.5 | 0.86              | 3.15 | 36.8 | 8.3  |                           |              |              |              |          |              |
|            | 6.8        | 2.5           | 5.8          | 900                       | 25.8 | 19.5 | 0.76              | 2.81 | 35.4 | 9.2  |                           |              |              |              |          |              |
|            | 6.8        | 2.5           | 5.8          | 1250                      | 26.8 | 22.7 | 0.85              | 2.97 | 36.9 | 9.0  |                           |              |              |              |          |              |
|            | 9.0        | 3.8           | 8.8          | 900                       | 26.1 | 19.5 | 0.75              | 2.72 | 35.5 | 9.6  |                           |              |              |              |          |              |
|            | 9.0        | 3.8           | 8.8          | 1250                      | 27.1 | 22.7 | 0.84              | 2.88 | 37.0 | 9.4  |                           |              |              |              |          |              |

### LEGEND

|        |   |
|--------|---|
| AHRI   | — Air Conditioning, Heating and Refrigeration Institute |
| COP    | — Coefficient of Performance                            |
| db     | — Dry Bulb  |
| EER    | — Energy Efficiency Ratio                               |
| EWT    | — Entering Water Temperature                            |
| GPM    | — Gallons Per Minute                                    |
| HE     | — Heat of Extraction (MBtu/h)                           |
| ISO    | — International Organization for Standardization        |
| LAT    | — Leaving Air Temperature (F)                           |
| MBtu/h | — Btu/h in Thousands                                    |
| TC     | — Total Capacity (MBtu/h)                               |
| THC    | — Total Heating Capacity (MBtu/h)                       |
| THR    | — Total Heat Rejection (MBtu/h)                         |
| TSC    | — Total Sensible Capacity (MBtu/h)                      |
| wb     | — Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD042

### 1,400 CFM NOMINAL AIRFLOW COOLING/1,400 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM          | PRESSURE DROP |            | COOLING                   |      |      |                   |      |      |      | HEATING                   |              |              |              |          |              |
|------------|--------------|---------------|------------|---------------------------|------|------|-------------------|------|------|------|---------------------------|--------------|--------------|--------------|----------|--------------|
|            |              | PSI           | ft wg      | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC          | kW           | HE           | LAT      | COP          |
| 20         | 11.0<br>11.0 | 4.0<br>4.0    | 9.2<br>9.2 | Operation Not Recommended |      |      |                   |      |      |      | 1050<br>1400              | 25.8<br>26.6 | 2.53<br>2.34 | 17.6<br>18.7 | 93<br>88 | 2.98<br>3.33 |
| 30         | 5.5          | 1.1           | 2.5        | 1050                      | 42.9 | 27.1 | 0.63              | 1.40 | 47.6 | 30.6 | 1050                      | 28.0         | 2.57         | 19.6         | 95       | 3.19         |
|            | 5.5          | 1.1           | 2.5        | 1400                      | 44.6 | 31.5 | 0.71              | 1.48 | 49.6 | 30.1 | 1400                      | 28.8         | 2.38         | 20.8         | 89       | 3.55         |
|            | 8.3          | 2.2           | 5.1        | 1050                      | 43.2 | 27.1 | 0.63              | 1.33 | 47.6 | 32.4 | 1050                      | 29.0         | 2.59         | 20.5         | 96       | 3.28         |
|            | 8.3          | 2.2           | 5.1        | 1400                      | 44.9 | 31.6 | 0.70              | 1.41 | 49.7 | 31.8 | 1400                      | 29.9         | 2.39         | 21.8         | 90       | 3.66         |
|            | 11.0         | 3.9           | 9.0        | 1050                      | 43.7 | 27.2 | 0.62              | 1.30 | 48.0 | 33.6 | 1050                      | 29.6         | 2.60         | 21.0         | 96       | 3.33         |
| 40         | 11.0         | 3.9           | 9.0        | 1400                      | 45.4 | 31.6 | 0.70              | 1.38 | 50.1 | 33.0 | 1400                      | 30.5         | 2.40         | 22.3         | 90       | 3.72         |
|            | 5.5          | 1.0           | 2.3        | 1050                      | 44.0 | 28.9 | 0.66              | 1.51 | 49.0 | 29.1 | 1050                      | 32.1         | 2.64         | 23.3         | 98       | 3.56         |
|            | 5.5          | 1.0           | 2.3        | 1400                      | 45.7 | 33.6 | 0.73              | 1.60 | 51.1 | 28.6 | 1400                      | 33.1         | 2.44         | 24.8         | 92       | 3.97         |
|            | 8.3          | 2.1           | 4.9        | 1050                      | 44.3 | 29.0 | 0.65              | 1.46 | 49.2 | 30.4 | 1050                      | 33.5         | 2.66         | 24.7         | 100      | 3.69         |
|            | 8.3          | 2.1           | 4.9        | 1400                      | 46.1 | 33.8 | 0.73              | 1.54 | 51.3 | 29.9 | 1400                      | 34.6         | 2.46         | 26.2         | 93       | 4.12         |
| 50         | 11.0         | 3.7           | 8.5        | 1050                      | 44.6 | 29.1 | 0.65              | 1.42 | 49.3 | 31.4 | 1050                      | 34.4         | 2.68         | 25.4         | 100      | 3.76         |
|            | 11.0         | 3.7           | 8.5        | 1400                      | 46.3 | 33.9 | 0.73              | 1.50 | 51.4 | 30.9 | 1400                      | 35.4         | 2.47         | 27.0         | 93       | 4.20         |
|            | 5.5          | 0.9           | 2.1        | 1050                      | 43.3 | 29.5 | 0.68              | 1.69 | 49.0 | 25.7 | 1050                      | 36.8         | 2.71         | 27.7         | 102      | 3.97         |
|            | 5.5          | 0.9           | 2.1        | 1400                      | 45.1 | 34.3 | 0.76              | 1.78 | 51.1 | 25.2 | 1400                      | 37.9         | 2.51         | 29.4         | 95       | 4.43         |
|            | 8.3          | 2.1           | 4.9        | 1050                      | 44.0 | 29.6 | 0.67              | 1.59 | 49.4 | 27.6 | 1050                      | 38.7         | 2.74         | 29.4         | 104      | 4.13         |
| 60         | 8.3          | 2.1           | 4.9        | 1400                      | 45.8 | 34.4 | 0.75              | 1.69 | 51.5 | 27.2 | 1400                      | 39.9         | 2.53         | 31.2         | 96       | 4.61         |
|            | 11.0         | 3.6           | 8.3        | 1050                      | 44.3 | 29.6 | 0.67              | 1.55 | 49.4 | 28.6 | 1050                      | 39.7         | 2.76         | 30.4         | 105      | 4.22         |
|            | 11.0         | 3.6           | 8.3        | 1400                      | 46.0 | 34.5 | 0.75              | 1.64 | 51.5 | 28.1 | 1400                      | 41.0         | 2.55         | 32.3         | 97       | 4.71         |
|            | 5.5          | 0.9           | 2.1        | 1050                      | 41.6 | 28.7 | 0.69              | 1.86 | 47.9 | 22.4 | 1050                      | 41.8         | 2.79         | 32.2         | 107      | 4.39         |
|            | 5.5          | 0.9           | 2.1        | 1400                      | 43.3 | 33.4 | 0.77              | 1.96 | 49.9 | 22.0 | 1400                      | 43.1         | 2.58         | 34.3         | 98       | 4.89         |
| 70         | 8.3          | 2.0           | 4.6        | 1050                      | 42.7 | 29.2 | 0.68              | 1.75 | 48.6 | 24.4 | 1050                      | 44.0         | 2.83         | 34.3         | 109      | 4.56         |
|            | 8.3          | 2.0           | 4.6        | 1400                      | 44.4 | 34.0 | 0.77              | 1.85 | 50.7 | 24.0 | 1400                      | 45.4         | 2.62         | 36.5         | 100      | 5.09         |
|            | 11.0         | 3.5           | 8.1        | 1050                      | 43.2 | 29.4 | 0.68              | 1.70 | 48.9 | 25.4 | 1050                      | 45.3         | 2.85         | 35.4         | 110      | 4.65         |
|            | 11.0         | 3.5           | 8.1        | 1400                      | 44.9 | 34.2 | 0.76              | 1.80 | 51.0 | 25.0 | 1400                      | 46.7         | 2.63         | 37.7         | 101      | 5.19         |
|            | 5.5          | 0.8           | 1.8        | 1050                      | 39.4 | 27.6 | 0.70              | 2.05 | 46.3 | 19.2 | 1050                      | 46.8         | 2.88         | 36.8         | 111      | 4.77         |
| 80         | 5.5          | 0.8           | 1.8        | 1400                      | 40.9 | 32.1 | 0.78              | 2.17 | 48.3 | 18.9 | 1400                      | 48.3         | 2.66         | 39.2         | 102      | 5.32         |
|            | 8.3          | 2.0           | 4.6        | 1050                      | 40.7 | 28.3 | 0.69              | 1.93 | 47.3 | 21.1 | 1050                      | 49.3         | 2.93         | 39.1         | 113      | 4.94         |
|            | 8.3          | 2.0           | 4.6        | 1400                      | 42.4 | 32.9 | 0.78              | 2.04 | 49.3 | 20.7 | 1400                      | 50.8         | 2.70         | 41.6         | 104      | 5.51         |
|            | 11.0         | 3.2           | 7.4        | 1050                      | 41.4 | 28.6 | 0.69              | 1.87 | 47.7 | 22.1 | 1050                      | 50.6         | 2.95         | 40.3         | 115      | 5.02         |
|            | 11.0         | 3.2           | 7.4        | 1400                      | 43.0 | 33.3 | 0.77              | 1.98 | 49.8 | 21.7 | 1400                      | 52.2         | 2.73         | 42.8         | 105      | 5.60         |
| 90         | 5.5          | 0.7           | 1.6        | 1050                      | 36.9 | 26.3 | 0.71              | 2.27 | 44.7 | 16.2 | 1050                      | 51.6         | 2.97         | 41.2         | 115      | 5.08         |
|            | 5.5          | 0.7           | 1.6        | 1400                      | 38.4 | 30.6 | 0.80              | 2.40 | 46.6 | 16.0 | 1400                      | 53.2         | 2.75         | 43.8         | 105      | 5.67         |
|            | 8.3          | 1.9           | 4.4        | 1050                      | 38.3 | 27.0 | 0.70              | 2.14 | 45.6 | 17.9 | 1050                      | 54.1         | 3.03         | 43.4         | 118      | 5.23         |
|            | 8.3          | 1.9           | 4.4        | 1400                      | 39.9 | 31.5 | 0.79              | 2.26 | 47.6 | 17.6 | 1400                      | 55.8         | 2.80         | 46.1         | 107      | 5.83         |
|            | 11.0         | 3.2           | 7.4        | 1050                      | 39.1 | 27.4 | 0.70              | 2.08 | 46.1 | 18.8 | 1050                      | 55.3         | 3.07         | 44.5         | 119      | 5.29         |
| 100        | 11.0         | 3.2           | 7.4        | 1400                      | 40.6 | 31.9 | 0.79              | 2.20 | 48.1 | 18.5 | 1400                      | 57.0         | 2.83         | 47.3         | 108      | 5.90         |
|            | 5.5          | 0.7           | 1.6        | 1050                      | 35.7 | 25.7 | 0.72              | 2.40 | 43.9 | 14.8 | 1050                      | 53.7         | 3.03         | 43.1         | 117      | 5.20         |
|            | 5.5          | 0.7           | 1.6        | 1400                      | 37.1 | 29.9 | 0.81              | 2.54 | 45.8 | 14.6 | 1400                      | 55.4         | 2.80         | 45.8         | 107      | 5.80         |
|            | 8.3          | 1.9           | 4.3        | 1050                      | 37.1 | 26.4 | 0.71              | 2.26 | 44.8 | 16.4 | 1050                      | 56.0         | 3.09         | 45.1         | 119      | 5.31         |
|            | 8.3          | 1.9           | 4.3        | 1400                      | 38.5 | 30.7 | 0.80              | 2.39 | 46.7 | 16.1 | 1400                      | 57.8         | 2.86         | 47.9         | 108      | 5.93         |
| 110        | 11.0         | 3.2           | 7.3        | 1050                      | 37.8 | 26.8 | 0.71              | 2.20 | 45.2 | 17.2 | 1050                      | 57.1         | 3.13         | 46.1         | 120      | 5.35         |
|            | 11.0         | 3.2           | 7.3        | 1400                      | 39.3 | 31.1 | 0.79              | 2.32 | 47.2 | 16.9 | 1400                      | 58.9         | 2.89         | 49.0         | 109      | 5.97         |
|            | 5.5          | 0.7           | 1.6        | 1050                      | 34.4 | 25.1 | 0.73              | 2.53 | 43.1 | 13.6 | 1050                      | 55.8         | 3.08         | 45.0         | 119      | 5.31         |
|            | 5.5          | 0.7           | 1.6        | 1400                      | 35.8 | 29.2 | 0.82              | 2.68 | 45.0 | 13.4 | 1400                      | 57.6         | 2.85         | 47.8         | 108      | 5.93         |
|            | 8.3          | 1.8           | 4.2        | 1050                      | 35.8 | 25.7 | 0.72              | 2.39 | 43.9 | 15.0 | 1050                      | 58.0         | 3.15         | 46.8         | 121      | 5.39         |
| 120        | 8.3          | 1.8           | 4.2        | 1400                      | 37.2 | 30.0 | 0.81              | 2.52 | 45.8 | 14.7 | 1400                      | 59.8         | 2.91         | 49.8         | 110      | 6.02         |
|            | 11.0         | 3.1           | 7.2        | 1050                      | 36.5 | 26.1 | 0.71              | 2.31 | 44.4 | 15.8 | 1050                      | 58.9         | 3.19         | 47.6         | 122      | 5.42         |
|            | 11.0         | 3.1           | 7.2        | 1400                      | 38.0 | 30.4 | 0.80              | 2.45 | 46.3 | 15.5 | 1400                      | 60.8         | 2.95         | 50.6         | 110      | 6.04         |
|            | 5.5          | 0.6           | 1.4        | 1050                      | 32.2 | 24.2 | 0.75              | 2.84 | 41.9 | 11.3 | Operation Not Recommended |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1400                      | 33.4 | 28.2 | 0.84              | 3.01 | 43.7 | 11.1 |                           |              |              |              |          |              |
| 100        | 8.3          | 1.8           | 4.2        | 1050                      | 33.3 | 24.6 | 0.74              | 2.67 | 42.5 | 12.5 |                           |              |              |              |          |              |
|            | 8.3          | 1.8           | 4.2        | 1400                      | 34.6 | 28.7 | 0.83              | 2.83 | 44.3 | 12.3 |                           |              |              |              |          |              |
|            | 11.0         | 2.9           | 6.7        | 1050                      | 34.0 | 24.9 | 0.73              | 2.59 | 42.8 | 13.1 |                           |              |              |              |          |              |
|            | 11.0         | 2.9           | 6.7        | 1400                      | 35.3 | 29.0 | 0.82              | 2.74 | 44.7 | 12.9 |                           |              |              |              |          |              |
| 110        | 5.5          | 0.6           | 1.4        | 1050                      | 30.3 | 23.9 | 0.79              | 3.20 | 41.4 | 9.5  |                           |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1400                      | 31.5 | 27.8 | 0.88              | 3.39 | 43.1 | 9.3  |                           |              |              |              |          |              |
|            | 8.3          | 1.7           | 3.9        | 1050                      | 31.2 | 24.0 | 0.77              | 3.01 | 41.5 | 10.4 |                           |              |              |              |          |              |
|            | 8.3          | 1.7           | 3.9        | 1400                      | 32.4 | 27.9 | 0.86              | 3.18 | 43.3 | 10.2 |                           |              |              |              |          |              |
|            | 11.0         | 2.9           | 6.7        | 1050                      | 31.7 | 24.1 | 0.76              | 2.91 | 41.7 | 10.9 |                           |              |              |              |          |              |
| 120        | 11.0         | 2.9           | 6.7        | 1400                      | 33.0 | 28.0 | 0.85              | 3.08 | 43.5 | 10.7 |                           |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1050                      | 28.9 | 23.5 | 0.81              | 3.62 | 41.4 | 8.0  |                           |              |              |              |          |              |
|            | 5.5          | 0.6           | 1.4        | 1400                      | 30.1 | 27.4 | 0.91              | 3.83 | 43.2 | 7.9  |                           |              |              |              |          |              |
|            | 8.3          | 1.6           | 3.7        | 1050                      | 29.7 | 23.9 | 0.80              | 3.40 | 41.4 | 8.7  |                           |              |              |              |          |              |
|            | 8.3          | 1.6           | 3.7        | 1400                      | 30.9 | 27.8 | 0.90              | 3.60 | 43.2 | 8.6  |                           |              |              |              |          |              |
| 120        | 11.0         | 2.7           | 6.2        | 1050                      | 30.1 | 24.0 | 0.80              | 3.30 | 41.5 | 9.1  |                           |              |              |              |          |              |
|            | 11.0         | 2.7           | 6.2        | 1400                      | 31.3 | 28.0 | 0.89              | 3.49 | 43.3 | 9.0  |                           |              |              |              |          |              |

#### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

#### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD048

## 1,550 CFM NOMINAL AIRFLOW COOLING/1,650 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM  | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|------|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |      | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 12.0 | 4.8           | 11.1  | Operation Not Recommended |      |      |                   |      |      |      | 1200                      | 32.9 | 3.41 | 21.9 | 95  | 2.82 |
|            | 12.0 | 4.8           | 11.1  |                           |      |      |                   |      |      |      | 1650                      | 33.9 | 3.15 | 23.2 | 89  | 3.15 |
| 30         | 6.0  | 1.3           | 3.0   | 1120                      | 53.5 | 31.9 | 0.60              | 1.91 | 59.9 | 28.0 | 1200                      | 35.4 | 3.47 | 24.2 | 97  | 2.99 |
|            | 6.0  | 1.3           | 3.0   | 1550                      | 55.6 | 37.1 | 0.67              | 2.02 | 62.5 | 27.5 | 1650                      | 36.5 | 3.21 | 25.7 | 91  | 3.34 |
|            | 9.0  | 2.6           | 6.0   | 1120                      | 54.1 | 31.9 | 0.59              | 1.81 | 60.1 | 29.9 | 1200                      | 36.8 | 3.51 | 25.4 | 98  | 3.08 |
|            | 9.0  | 2.6           | 6.0   | 1550                      | 56.2 | 37.1 | 0.66              | 1.91 | 62.7 | 29.4 | 1650                      | 38.0 | 3.24 | 27.0 | 91  | 3.44 |
|            | 12.0 | 4.5           | 10.4  | 1120                      | 54.8 | 32.1 | 0.59              | 1.76 | 60.6 | 31.1 | 1200                      | 37.6 | 3.52 | 26.2 | 99  | 3.13 |
|            | 12.0 | 4.5           | 10.4  | 1550                      | 56.9 | 37.4 | 0.66              | 1.86 | 63.2 | 30.5 | 1650                      | 38.8 | 3.26 | 27.8 | 92  | 3.49 |
| 40         | 6.0  | 1.2           | 2.8   | 1120                      | 54.3 | 32.8 | 0.60              | 2.09 | 61.3 | 26.0 | 1200                      | 40.3 | 3.58 | 28.6 | 101 | 3.30 |
|            | 6.0  | 1.2           | 2.8   | 1550                      | 56.5 | 38.2 | 0.68              | 2.21 | 64.0 | 25.6 | 1650                      | 41.6 | 3.31 | 30.4 | 93  | 3.68 |
|            | 9.0  | 2.6           | 6.0   | 1120                      | 54.8 | 32.8 | 0.60              | 1.97 | 61.4 | 27.9 | 1200                      | 42.2 | 3.62 | 30.3 | 103 | 3.42 |
|            | 9.0  | 2.6           | 6.0   | 1550                      | 57.0 | 38.2 | 0.67              | 2.08 | 64.1 | 27.4 | 1650                      | 43.6 | 3.34 | 32.2 | 94  | 3.82 |
|            | 12.0 | 4.4           | 10.2  | 1120                      | 55.1 | 32.8 | 0.60              | 1.91 | 61.4 | 28.8 | 1200                      | 43.3 | 3.64 | 31.3 | 103 | 3.49 |
|            | 12.0 | 4.4           | 10.2  | 1550                      | 57.3 | 38.2 | 0.67              | 2.02 | 64.1 | 28.3 | 1650                      | 44.7 | 3.36 | 33.3 | 95  | 3.89 |
| 50         | 6.0  | 1.1           | 2.5   | 1120                      | 53.5 | 32.9 | 0.62              | 2.31 | 61.3 | 23.2 | 1200                      | 45.8 | 3.69 | 33.5 | 105 | 3.64 |
|            | 6.0  | 1.1           | 2.5   | 1550                      | 55.6 | 38.3 | 0.69              | 2.44 | 63.9 | 22.8 | 1650                      | 47.2 | 3.41 | 35.6 | 96  | 4.06 |
|            | 9.0  | 2.5           | 5.8   | 1120                      | 54.4 | 33.1 | 0.61              | 2.16 | 61.6 | 25.2 | 1200                      | 48.2 | 3.74 | 35.7 | 107 | 3.78 |
|            | 9.0  | 2.5           | 5.8   | 1550                      | 56.5 | 38.5 | 0.68              | 2.28 | 64.3 | 24.8 | 1650                      | 49.7 | 3.45 | 37.9 | 98  | 4.22 |
|            | 12.0 | 4.2           | 9.7   | 1120                      | 54.7 | 33.1 | 0.61              | 2.09 | 61.7 | 26.2 | 1200                      | 49.5 | 3.76 | 36.9 | 108 | 3.86 |
|            | 12.0 | 4.2           | 9.7   | 1550                      | 56.8 | 38.5 | 0.68              | 2.21 | 64.3 | 25.7 | 1650                      | 51.1 | 3.48 | 39.3 | 99  | 4.30 |
| 60         | 6.0  | 1.0           | 2.3   | 1120                      | 51.7 | 32.4 | 0.63              | 2.55 | 60.3 | 20.2 | 1200                      | 51.5 | 3.80 | 38.7 | 110 | 3.97 |
|            | 6.0  | 1.0           | 2.3   | 1550                      | 53.7 | 37.7 | 0.70              | 2.70 | 62.9 | 19.9 | 1650                      | 53.1 | 3.52 | 41.1 | 100 | 4.43 |
|            | 9.0  | 2.4           | 5.5   | 1120                      | 53.0 | 32.8 | 0.62              | 2.38 | 61.0 | 22.3 | 1200                      | 54.4 | 3.86 | 41.3 | 112 | 4.13 |
|            | 9.0  | 2.4           | 5.5   | 1550                      | 55.1 | 38.2 | 0.69              | 2.52 | 63.7 | 21.9 | 1650                      | 56.1 | 3.57 | 43.9 | 101 | 4.60 |
|            | 12.0 | 4.0           | 9.2   | 1120                      | 53.6 | 32.9 | 0.61              | 2.30 | 61.3 | 23.3 | 1200                      | 56.0 | 3.89 | 42.8 | 113 | 4.21 |
|            | 12.0 | 4.0           | 9.2   | 1550                      | 55.7 | 38.3 | 0.69              | 2.43 | 64.0 | 22.9 | 1650                      | 57.7 | 3.60 | 45.4 | 102 | 4.70 |
| 70         | 6.0  | 1.0           | 2.3   | 1120                      | 49.3 | 31.6 | 0.64              | 2.83 | 58.9 | 17.4 | 1200                      | 57.3 | 3.92 | 44.0 | 114 | 4.28 |
|            | 6.0  | 1.0           | 2.3   | 1550                      | 51.3 | 36.7 | 0.72              | 3.00 | 61.5 | 17.1 | 1650                      | 59.1 | 3.63 | 46.7 | 103 | 4.78 |
|            | 9.0  | 2.3           | 5.3   | 1120                      | 51.0 | 32.2 | 0.63              | 2.64 | 59.9 | 19.3 | 1200                      | 60.6 | 3.99 | 46.9 | 117 | 4.45 |
|            | 9.0  | 2.3           | 5.3   | 1550                      | 53.0 | 37.4 | 0.71              | 2.79 | 62.5 | 19.0 | 1650                      | 62.4 | 3.69 | 49.8 | 105 | 4.96 |
|            | 12.0 | 3.8           | 8.8   | 1120                      | 51.8 | 32.4 | 0.63              | 2.54 | 60.4 | 20.3 | 1200                      | 62.3 | 4.03 | 48.5 | 118 | 4.53 |
|            | 12.0 | 3.8           | 8.8   | 1550                      | 53.8 | 37.7 | 0.70              | 2.69 | 63.0 | 20.0 | 1650                      | 64.2 | 3.73 | 51.5 | 106 | 5.05 |
| 80         | 6.0  | 0.9           | 2.1   | 1120                      | 46.6 | 30.6 | 0.66              | 3.15 | 57.3 | 14.8 | 1200                      | 63.0 | 4.05 | 49.1 | 119 | 4.56 |
|            | 6.0  | 0.9           | 2.1   | 1550                      | 48.4 | 35.6 | 0.73              | 3.33 | 59.8 | 14.5 | 1650                      | 65.0 | 3.74 | 52.2 | 106 | 5.09 |
|            | 9.0  | 2.3           | 5.3   | 1120                      | 48.4 | 31.3 | 0.65              | 2.93 | 58.4 | 16.5 | 1200                      | 66.4 | 4.13 | 52.2 | 121 | 4.71 |
|            | 9.0  | 2.3           | 5.3   | 1550                      | 50.4 | 36.4 | 0.72              | 3.10 | 60.9 | 16.2 | 1650                      | 68.5 | 3.82 | 55.4 | 108 | 5.26 |
|            | 12.0 | 3.6           | 8.3   | 1120                      | 49.3 | 31.6 | 0.64              | 2.83 | 58.9 | 17.4 | 1200                      | 68.2 | 4.18 | 53.7 | 123 | 4.79 |
|            | 12.0 | 3.6           | 8.3   | 1550                      | 51.3 | 36.8 | 0.72              | 2.99 | 61.5 | 17.1 | 1650                      | 70.3 | 3.86 | 57.1 | 109 | 5.34 |
| 85         | 6.0  | 0.9           | 2.1   | 1120                      | 45.1 | 30.1 | 0.67              | 3.33 | 56.5 | 13.5 | 1200                      | 65.7 | 4.12 | 51.5 | 121 | 4.68 |
|            | 6.0  | 0.9           | 2.1   | 1550                      | 46.9 | 35.0 | 0.75              | 3.52 | 59.0 | 13.3 | 1650                      | 67.8 | 3.80 | 54.7 | 108 | 5.22 |
|            | 9.0  | 2.3           | 5.2   | 1120                      | 47.0 | 30.7 | 0.65              | 3.10 | 57.6 | 15.2 | 1200                      | 69.1 | 4.20 | 54.5 | 123 | 4.81 |
|            | 9.0  | 2.3           | 5.2   | 1550                      | 48.9 | 35.8 | 0.73              | 3.28 | 60.1 | 14.9 | 1650                      | 71.2 | 3.89 | 57.9 | 110 | 5.37 |
|            | 12.0 | 3.6           | 8.2   | 1120                      | 48.0 | 31.1 | 0.65              | 2.99 | 58.1 | 16.0 | 1200                      | 70.8 | 4.25 | 56.0 | 125 | 4.88 |
|            | 12.0 | 3.6           | 8.2   | 1550                      | 49.8 | 36.2 | 0.73              | 3.17 | 60.6 | 15.7 | 1650                      | 73.0 | 3.93 | 59.5 | 111 | 5.44 |
| 90         | 6.0  | 0.9           | 2.1   | 1120                      | 43.7 | 29.5 | 0.68              | 3.51 | 55.7 | 12.4 | 1200                      | 68.4 | 4.18 | 53.9 | 123 | 4.79 |
|            | 6.0  | 0.9           | 2.1   | 1550                      | 45.4 | 34.4 | 0.76              | 3.72 | 58.1 | 12.2 | 1650                      | 70.5 | 3.86 | 57.3 | 110 | 5.35 |
|            | 9.0  | 2.2           | 5.1   | 1120                      | 45.6 | 30.2 | 0.66              | 3.27 | 56.8 | 13.9 | 1200                      | 71.7 | 4.28 | 56.8 | 125 | 4.91 |
|            | 9.0  | 2.2           | 5.1   | 1550                      | 47.4 | 35.2 | 0.74              | 3.46 | 59.2 | 13.7 | 1650                      | 73.9 | 3.95 | 60.4 | 111 | 5.48 |
|            | 12.0 | 3.5           | 8.1   | 1120                      | 46.6 | 30.6 | 0.66              | 3.16 | 57.3 | 14.8 | 1200                      | 73.3 | 4.33 | 58.2 | 127 | 4.96 |
|            | 12.0 | 3.5           | 8.1   | 1550                      | 48.4 | 35.6 | 0.74              | 3.34 | 59.8 | 14.5 | 1650                      | 75.6 | 4.00 | 61.9 | 112 | 5.54 |
| 100        | 6.0  | 0.8           | 1.8   | 1120                      | 40.8 | 28.5 | 0.70              | 3.92 | 54.3 | 10.4 | Operation Not Recommended |      |      |      |     |      |
|            | 6.0  | 0.8           | 1.8   | 1550                      | 42.4 | 33.2 | 0.78              | 4.15 | 56.6 | 10.2 |                           |      |      |      |     |      |
|            | 9.0  | 2.1           | 4.9   | 1120                      | 42.6 | 29.2 | 0.68              | 3.66 | 55.2 | 11.7 |                           |      |      |      |     |      |
|            | 9.0  | 2.1           | 4.9   | 1550                      | 44.3 | 33.9 | 0.77              | 3.87 | 57.5 | 11.5 |                           |      |      |      |     |      |
|            | 12.0 | 3.3           | 7.6   | 1120                      | 43.6 | 29.5 | 0.68              | 3.53 | 55.7 | 12.3 |                           |      |      |      |     |      |
|            | 12.0 | 3.3           | 7.6   | 1550                      | 45.3 | 34.3 | 0.76              | 3.73 | 58.1 | 12.1 |                           |      |      |      |     |      |
| 110        | 6.0  | 0.8           | 1.8   | 1120                      | 38.0 | 27.7 | 0.73              | 4.39 | 53.1 | 8.6  |                           |      |      |      |     |      |
|            | 6.0  | 0.8           | 1.8   | 1550                      | 39.5 | 32.2 | 0.82              | 4.65 | 55.4 | 8.5  |                           |      |      |      |     |      |
|            | 9.0  | 2.0           | 4.6   | 1120                      | 39.7 | 28.2 | 0.71              | 4.10 | 53.8 | 9.7  |                           |      |      |      |     |      |
|            | 9.0  | 2.0           | 4.6   | 1550                      | 41.3 | 32.8 | 0.80              | 4.33 | 56.1 | 9.5  |                           |      |      |      |     |      |
|            | 12.0 | 3.2           | 7.4   | 1120                      | 40.6 | 28.5 | 0.70              | 3.95 | 54.2 | 10.3 |                           |      |      |      |     |      |
|            | 12.0 | 3.2           | 7.4   | 1550                      | 42.2 | 33.1 | 0.79              | 4.18 | 56.5 | 10.1 |                           |      |      |      |     |      |
| 120        | 6.0  | 0.7           | 1.6   | 1120                      | 35.5 | 27.1 | 0.76              | 4.93 | 52.5 | 7.2  |                           |      |      |      |     |      |
|            | 6.0  | 0.7           | 1.6   | 1550                      | 36.9 | 31.6 | 0.85              | 5.21 | 54.8 | 7.1  |                           |      |      |      |     |      |
|            | 9.0  | 1.9           | 4.4   | 1120                      | 37.0 | 27.4 | 0.74              | 4.59 | 52.8 | 8.0  |                           |      |      |      |     |      |
|            | 9.0  | 1.9           | 4.4   | 1550                      | 38.4 | 31.9 | 0.83              | 4.86 | 55.1 | 7.9  |                           |      |      |      |     |      |
|            | 12.0 | 3.0           | 6.9   | 1120                      | 37.8 | 27.6 | 0.73              | 4.44 | 53.0 | 8.5  |                           |      |      |      |     |      |
|            | 12.0 | 3.0           | 6.9   | 1550                      | 39.3 | 32.1 | 0.82              | 4.69 | 55.3 | 8.4  |                           |      |      |      |     |      |

### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## 50PSH,PSV,PSD060

1,825 CFM NOMINAL AIRFLOW COOLING/2,050 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM  | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |      |      |      |     |      |
|------------|------|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|------|------|------|-----|------|
|            |      | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC  | kW   | HE   | LAT | COP  |
| 20         | 15.0 | 5.0           | 11.6  | Operation Not Recommended |      |      |                   |      |      |      | 1470                      | 39.6 | 4.02 | 26.6 | 95  | 2.89 |
|            | 15.0 | 5.0           | 11.6  |                           |      |      |                   |      |      |      | 2050                      | 40.9 | 3.72 | 28.3 | 88  | 3.22 |
| 30         | 7.5  | 0.6           | 1.4   | 1320                      | 62.0 | 37.7 | 0.61              | 2.30 | 69.7 | 26.9 | 1470                      | 42.9 | 4.09 | 29.5 | 97  | 3.07 |
|            | 7.5  | 0.6           | 1.4   | 1825                      | 64.4 | 43.9 | 0.68              | 2.44 | 72.7 | 26.5 | 2050                      | 44.2 | 3.78 | 31.4 | 90  | 3.42 |
|            | 11.3 | 2.3           | 5.3   | 1320                      | 63.4 | 38.5 | 0.61              | 2.32 | 71.2 | 27.4 | 1470                      | 44.5 | 4.13 | 31.0 | 98  | 3.16 |
|            | 11.3 | 2.3           | 5.3   | 1825                      | 65.9 | 44.8 | 0.68              | 2.45 | 74.2 | 26.9 | 2050                      | 45.9 | 3.82 | 33.0 | 91  | 3.52 |
|            | 15.0 | 4.8           | 11.1  | 1320                      | 65.6 | 39.8 | 0.61              | 2.27 | 73.2 | 28.9 | 1470                      | 45.4 | 4.15 | 31.8 | 99  | 3.21 |
|            | 15.0 | 4.8           | 11.1  | 1825                      | 68.2 | 46.3 | 0.68              | 2.40 | 76.4 | 28.4 | 2050                      | 46.8 | 3.83 | 33.8 | 91  | 3.58 |
| 40         | 7.5  | 0.5           | 1.2   | 1320                      | 65.6 | 40.3 | 0.61              | 2.57 | 74.2 | 25.5 | 1470                      | 48.6 | 4.21 | 34.7 | 101 | 3.38 |
|            | 7.5  | 0.5           | 1.2   | 1825                      | 68.2 | 46.9 | 0.69              | 2.72 | 77.4 | 25.1 | 2050                      | 50.1 | 3.89 | 36.9 | 93  | 3.77 |
|            | 11.3 | 2.2           | 5.1   | 1320                      | 66.3 | 40.5 | 0.61              | 2.49 | 74.7 | 26.6 | 1470                      | 50.7 | 4.25 | 36.6 | 102 | 3.49 |
|            | 11.3 | 2.2           | 5.1   | 1825                      | 69.0 | 47.1 | 0.68              | 2.64 | 77.9 | 26.1 | 2050                      | 52.2 | 3.93 | 38.9 | 94  | 3.90 |
|            | 15.0 | 4.5           | 10.4  | 1320                      | 67.1 | 40.9 | 0.61              | 2.45 | 75.3 | 27.4 | 1470                      | 51.8 | 4.27 | 37.7 | 103 | 3.55 |
|            | 15.0 | 4.5           | 10.4  | 1825                      | 69.8 | 47.6 | 0.68              | 2.59 | 78.6 | 26.9 | 2050                      | 53.4 | 3.95 | 40.0 | 94  | 3.96 |
| 50         | 7.5  | 0.4           | 0.9   | 1320                      | 66.5 | 41.3 | 0.62              | 2.84 | 76.0 | 23.4 | 1470                      | 54.7 | 4.33 | 40.3 | 104 | 3.70 |
|            | 7.5  | 0.4           | 0.9   | 1825                      | 69.1 | 48.1 | 0.70              | 3.00 | 79.3 | 23.0 | 2050                      | 56.4 | 4.00 | 42.8 | 95  | 4.13 |
|            | 11.3 | 2.1           | 4.9   | 1320                      | 67.2 | 41.4 | 0.62              | 2.69 | 76.2 | 25.0 | 1470                      | 57.2 | 4.38 | 42.6 | 106 | 3.83 |
|            | 11.3 | 2.1           | 4.9   | 1825                      | 69.9 | 48.2 | 0.69              | 2.85 | 79.5 | 24.5 | 2050                      | 59.0 | 4.04 | 45.3 | 97  | 4.28 |
|            | 15.0 | 4.3           | 9.9   | 1320                      | 68.1 | 41.9 | 0.61              | 2.62 | 76.9 | 26.0 | 1470                      | 58.7 | 4.40 | 43.9 | 107 | 3.90 |
|            | 15.0 | 4.3           | 9.9   | 1825                      | 70.8 | 48.7 | 0.69              | 2.77 | 80.2 | 25.5 | 2050                      | 60.5 | 4.07 | 46.6 | 97  | 4.36 |
| 60         | 7.5  | 0.3           | 0.7   | 1320                      | 65.3 | 41.3 | 0.63              | 3.11 | 75.8 | 21.0 | 1470                      | 61.0 | 4.45 | 46.0 | 108 | 4.02 |
|            | 7.5  | 0.3           | 0.7   | 1825                      | 67.9 | 48.0 | 0.71              | 3.29 | 79.1 | 20.6 | 2050                      | 62.9 | 4.11 | 48.9 | 98  | 4.49 |
|            | 11.3 | 2.1           | 4.9   | 1320                      | 66.5 | 41.6 | 0.62              | 2.93 | 76.4 | 22.7 | 1470                      | 64.0 | 4.50 | 48.7 | 110 | 4.16 |
|            | 11.3 | 2.1           | 4.9   | 1825                      | 69.1 | 48.4 | 0.70              | 3.09 | 79.7 | 22.3 | 2050                      | 66.0 | 4.16 | 51.8 | 100 | 4.65 |
|            | 15.0 | 4.1           | 9.5   | 1320                      | 66.9 | 41.6 | 0.62              | 2.84 | 76.5 | 23.6 | 1470                      | 65.6 | 4.54 | 50.2 | 111 | 4.24 |
|            | 15.0 | 4.1           | 9.5   | 1825                      | 69.6 | 48.4 | 0.70              | 3.00 | 79.8 | 23.2 | 2050                      | 67.6 | 4.19 | 53.3 | 101 | 4.73 |
| 70         | 7.5  | 0.3           | 0.7   | 1320                      | 63.4 | 40.7 | 0.64              | 3.35 | 74.7 | 18.9 | 1470                      | 66.1 | 4.55 | 50.7 | 112 | 4.26 |
|            | 7.5  | 0.3           | 0.7   | 1825                      | 65.9 | 47.4 | 0.72              | 3.54 | 77.9 | 18.6 | 2050                      | 68.2 | 4.20 | 53.8 | 101 | 4.76 |
|            | 11.3 | 2.0           | 4.6   | 1320                      | 64.6 | 41.1 | 0.64              | 3.20 | 75.4 | 20.2 | 1470                      | 70.7 | 4.64 | 54.8 | 115 | 4.47 |
|            | 11.3 | 2.0           | 4.6   | 1825                      | 67.2 | 47.8 | 0.71              | 3.38 | 78.7 | 19.9 | 2050                      | 72.9 | 4.28 | 58.2 | 103 | 4.98 |
|            | 15.0 | 3.9           | 9.0   | 1320                      | 65.4 | 41.3 | 0.63              | 3.10 | 75.9 | 21.1 | 1470                      | 72.4 | 4.67 | 56.4 | 116 | 4.54 |
|            | 15.0 | 3.9           | 9.0   | 1825                      | 68.0 | 48.1 | 0.71              | 3.28 | 79.1 | 20.8 | 2050                      | 74.7 | 4.32 | 59.9 | 104 | 5.07 |
| 80         | 7.5  | 0.2           | 0.5   | 1320                      | 59.7 | 39.5 | 0.66              | 3.76 | 72.5 | 15.9 | 1470                      | 73.6 | 4.70 | 57.4 | 116 | 4.59 |
|            | 7.5  | 0.2           | 0.5   | 1825                      | 62.1 | 46.0 | 0.74              | 3.98 | 75.6 | 15.6 | 2050                      | 75.9 | 4.34 | 61.0 | 104 | 5.12 |
|            | 11.3 | 1.9           | 4.4   | 1320                      | 61.9 | 40.2 | 0.65              | 3.52 | 73.8 | 17.6 | 1470                      | 77.0 | 4.77 | 60.5 | 119 | 4.73 |
|            | 11.3 | 1.9           | 4.4   | 1825                      | 64.3 | 46.8 | 0.73              | 3.72 | 77.0 | 17.3 | 2050                      | 79.4 | 4.41 | 64.3 | 106 | 5.28 |
|            | 15.0 | 3.6           | 8.3   | 1320                      | 62.9 | 40.6 | 0.64              | 3.40 | 74.4 | 18.5 | 1470                      | 78.8 | 4.81 | 62.1 | 120 | 4.80 |
|            | 15.0 | 3.6           | 8.3   | 1825                      | 65.4 | 47.2 | 0.72              | 3.60 | 77.6 | 18.2 | 2050                      | 81.3 | 4.45 | 66.0 | 107 | 5.36 |
| 85         | 7.5  | 0.2           | 0.5   | 1320                      | 57.9 | 38.9 | 0.67              | 3.96 | 71.4 | 14.6 | 1470                      | 76.5 | 4.76 | 60.1 | 118 | 4.71 |
|            | 7.5  | 0.2           | 0.5   | 1825                      | 60.2 | 45.3 | 0.75              | 4.19 | 74.5 | 14.4 | 2050                      | 78.9 | 4.40 | 63.8 | 106 | 5.25 |
|            | 11.3 | 1.9           | 4.3   | 1320                      | 60.2 | 39.7 | 0.66              | 3.70 | 72.8 | 16.3 | 1470                      | 79.9 | 4.84 | 63.1 | 120 | 4.84 |
|            | 11.3 | 1.9           | 4.3   | 1825                      | 62.6 | 46.2 | 0.74              | 3.92 | 75.9 | 16.0 | 2050                      | 82.4 | 4.47 | 67.1 | 107 | 5.40 |
|            | 15.0 | 3.6           | 8.2   | 1320                      | 61.3 | 40.0 | 0.65              | 3.58 | 73.5 | 17.1 | 1470                      | 81.7 | 4.89 | 64.7 | 121 | 4.90 |
|            | 15.0 | 3.6           | 8.2   | 1825                      | 63.7 | 46.6 | 0.73              | 3.79 | 76.6 | 16.8 | 2050                      | 84.2 | 4.51 | 68.7 | 108 | 5.47 |
| 90         | 7.5  | 0.2           | 0.5   | 1320                      | 56.2 | 38.3 | 0.68              | 4.17 | 70.4 | 13.5 | 1470                      | 79.4 | 4.83 | 62.7 | 120 | 4.82 |
|            | 7.5  | 0.2           | 0.5   | 1825                      | 58.4 | 44.5 | 0.76              | 4.41 | 73.4 | 13.2 | 2050                      | 81.9 | 4.46 | 66.6 | 107 | 5.38 |
|            | 11.3 | 1.8           | 4.2   | 1320                      | 58.5 | 39.1 | 0.67              | 3.89 | 71.8 | 15.0 | 1470                      | 82.8 | 4.91 | 65.7 | 122 | 4.94 |
|            | 11.3 | 1.8           | 4.2   | 1825                      | 60.8 | 45.5 | 0.75              | 4.12 | 74.9 | 14.8 | 2050                      | 85.4 | 4.54 | 69.8 | 109 | 5.51 |
|            | 15.0 | 3.5           | 8.1   | 1320                      | 59.7 | 39.5 | 0.66              | 3.76 | 72.5 | 15.9 | 1470                      | 84.5 | 4.96 | 67.2 | 123 | 5.00 |
|            | 15.0 | 3.5           | 8.1   | 1825                      | 62.1 | 46.0 | 0.74              | 3.98 | 75.6 | 15.6 | 2050                      | 87.1 | 4.58 | 71.4 | 109 | 5.57 |
| 100        | 7.5  | 0.1           | 0.2   | 1320                      | 52.4 | 37.0 | 0.71              | 4.64 | 68.3 | 11.3 | Operation Not Recommended |      |      |      |     |      |
|            | 7.5  | 0.1           | 0.2   | 1825                      | 54.5 | 43.1 | 0.79              | 4.91 | 71.3 | 11.1 |                           |      |      |      |     |      |
|            | 11.3 | 1.8           | 4.2   | 1320                      | 54.8 | 37.8 | 0.69              | 4.33 | 69.6 | 12.7 |                           |      |      |      |     |      |
|            | 11.3 | 1.8           | 4.2   | 1825                      | 57.0 | 44.0 | 0.77              | 4.58 | 72.6 | 12.4 |                           |      |      |      |     |      |
|            | 15.0 | 3.3           | 7.6   | 1320                      | 56.0 | 38.2 | 0.68              | 4.18 | 70.3 | 13.4 |                           |      |      |      |     |      |
|            | 15.0 | 3.3           | 7.6   | 1825                      | 58.3 | 44.5 | 0.76              | 4.42 | 73.4 | 13.2 |                           |      |      |      |     |      |
| 110        | 7.5  | 0.1           | 0.2   | 1320                      | 48.6 | 35.8 | 0.74              | 5.20 | 66.5 | 9.3  |                           |      |      |      |     |      |
|            | 7.5  | 0.1           | 0.2   | 1825                      | 50.5 | 41.6 | 0.82              | 5.50 | 69.4 | 9.2  |                           |      |      |      |     |      |
|            | 11.3 | 1.7           | 3.9   | 1320                      | 50.9 | 36.5 | 0.72              | 4.85 | 67.6 | 10.5 |                           |      |      |      |     |      |
|            | 11.3 | 1.7           | 3.9   | 1825                      | 53.0 | 42.5 | 0.80              | 5.13 | 70.5 | 10.3 |                           |      |      |      |     |      |
|            | 15.0 | 3.1           | 7.2   | 1320                      | 52.2 | 36.9 | 0.71              | 4.68 | 68.2 | 11.2 |                           |      |      |      |     |      |
|            | 15.0 | 3.1           | 7.2   | 1825                      | 54.2 | 43.0 | 0.79              | 4.95 | 71.1 | 11.0 |                           |      |      |      |     |      |
| 120        | 7.5  | 0.0           | 0.0   | 1320                      | 45.1 | 34.8 | 0.77              | 5.85 | 65.3 | 7.7  |                           |      |      |      |     |      |
|            | 7.5  | 0.0           | 0.0   | 1825                      | 46.9 | 40.5 | 0.86              | 6.19 | 68.1 | 7.6  |                           |      |      |      |     |      |
|            | 11.3 | 1.7           | 3.9   | 1320                      | 47.2 | 35.4 | 0.75              | 5.45 | 65.9 | 8.7  |                           |      |      |      |     |      |
|            | 11.3 | 1.7           | 3.9   | 1825                      | 49.1 | 41.1 | 0.84              | 5.76 | 68.8 | 8.5  |                           |      |      |      |     |      |
|            | 15.0 | 2.9           | 6.7   | 1320                      | 48.3 | 35.7 | 0.74              | 5.25 | 66.4 | 9.2  |                           |      |      |      |     |      |
|            | 15.0 | 2.9           | 6.7   | 1825                      | 50.2 | 41.5 | 0.83              | 5.56 | 69.2 | 9.0  |                           |      |      |      |     |      |

### LEGEND

|       |   |
|-------|---|
| AHRI  | — Air Conditioning, Heating and Refrigeration Institute |
| COP   | — Coefficient of Performance                            |
| db    | — Dry Bulb  |
| EER   | — Energy Efficiency Ratio                               |
| EWT   | — Entering Water Temperature                            |
| GPM   | — Gallons Per Minute                                    |
| HE    | — Heat of Extraction (MBtuh)                            |
| ISO   | — International Organization for Standardization        |
| LAT   | — Leaving Air Temperature (F)                           |
| MBtuh | — Btuh in Thousands                                     |
| TC    | — Total Capacity (MBtuh)                                |
| THC   | — Total Heating Capacity (MBtuh)                        |
| THR   | — Total Heat Rejection (MBtuh)                          |
| TSC   | — Total Sensible Capacity (MBtuh)                       |
| wb    | — Wet Bulb  |

### NOTES:

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80 F db and 67 F wb in cooling, and 70 F db in heating. AHRI/ISO certified conditions are 80.6 F db and 66.2 F wb in cooling and 68 F db in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# 50PSH,PSV,PSD070

## 1,950 CFM NOMINAL AIRFLOW COOLING/2,100 CFM NOMINAL AIRFLOW HEATING — ECM BLOWER

| EWT<br>(F) | GPM  | PRESSURE DROP |       | COOLING                   |      |      |                   |      |      |      | HEATING                   |       |      |      |     |      |
|------------|------|---------------|-------|---------------------------|------|------|-------------------|------|------|------|---------------------------|-------|------|------|-----|------|
|            |      | PSI           | ft wg | Airflow<br>CFM            | TC   | TSC  | Sens/Tot<br>Ratio | kW   | THR  | EER  | Airflow<br>CFM            | THC   | kW   | HE   | LAT | COP  |
| 20         | 16.5 | 9.1           | 21.0  | Operation Not Recommended |      |      |                   |      |      |      | 1520                      | 46.2  | 4.80 | 30.7 | 98  | 2.82 |
|            | 16.5 | 9.1           | 21.0  |                           |      |      |                   |      |      |      | 2100                      | 47.6  | 4.44 | 32.6 | 91  | 3.14 |
| 30         | 8.3  | 2.4           | 5.5   | 1450                      | 73.1 | 42.8 | 0.59              | 2.74 | 82.3 | 26.7 | 1520                      | 49.9  | 4.89 | 34.0 | 100 | 2.99 |
|            | 8.3  | 2.4           | 5.5   | 1950                      | 76.0 | 49.8 | 0.66              | 2.90 | 85.8 | 26.2 | 2100                      | 51.4  | 4.52 | 36.1 | 93  | 3.33 |
|            | 12.4 | 5.2           | 12.0  | 1450                      | 73.5 | 42.9 | 0.58              | 2.65 | 82.3 | 27.7 | 1520                      | 52.0  | 4.94 | 35.9 | 102 | 3.08 |
|            | 12.4 | 5.2           | 12.0  | 1950                      | 76.4 | 49.9 | 0.65              | 2.80 | 85.9 | 27.2 | 2100                      | 53.6  | 4.57 | 38.1 | 94  | 3.44 |
|            | 16.5 | 8.0           | 18.5  | 1450                      | 73.8 | 43.0 | 0.58              | 2.59 | 82.4 | 28.5 | 1520                      | 53.1  | 4.97 | 36.9 | 102 | 3.13 |
|            | 16.5 | 8.0           | 18.5  | 1950                      | 76.7 | 50.0 | 0.65              | 2.74 | 86.0 | 28.0 | 2100                      | 54.8  | 4.59 | 39.2 | 94  | 3.50 |
| 40         | 8.3  | 2.2           | 5.1   | 1450                      | 77.1 | 45.3 | 0.59              | 2.94 | 87.0 | 26.3 | 1520                      | 56.8  | 5.05 | 40.2 | 105 | 3.30 |
|            | 8.3  | 2.2           | 5.1   | 1950                      | 80.2 | 52.7 | 0.66              | 3.11 | 90.7 | 25.8 | 2100                      | 58.6  | 4.67 | 42.8 | 96  | 3.68 |
|            | 12.4 | 4.9           | 11.3  | 1450                      | 77.4 | 45.3 | 0.59              | 2.87 | 87.0 | 27.0 | 1520                      | 59.6  | 5.11 | 42.7 | 106 | 3.42 |
|            | 12.4 | 4.9           | 11.3  | 1950                      | 80.5 | 52.7 | 0.65              | 3.03 | 90.7 | 26.5 | 2100                      | 61.4  | 4.72 | 45.4 | 97  | 3.81 |
|            | 16.5 | 7.5           | 17.3  | 1450                      | 77.6 | 45.3 | 0.58              | 2.80 | 87.0 | 27.7 | 1520                      | 61.1  | 5.14 | 44.1 | 107 | 3.48 |
|            | 16.5 | 7.5           | 17.3  | 1950                      | 80.7 | 52.7 | 0.65              | 2.97 | 90.7 | 27.2 | 2100                      | 63.0  | 4.75 | 46.9 | 98  | 3.89 |
| 50         | 8.3  | 2.0           | 4.6   | 1450                      | 77.2 | 45.8 | 0.59              | 3.37 | 88.5 | 22.9 | 1520                      | 64.4  | 5.21 | 47.1 | 109 | 3.62 |
|            | 8.3  | 2.0           | 4.6   | 1950                      | 80.2 | 53.3 | 0.66              | 3.56 | 92.3 | 22.5 | 2100                      | 66.4  | 4.82 | 50.0 | 99  | 4.04 |
|            | 12.4 | 4.5           | 10.4  | 1450                      | 78.2 | 45.9 | 0.59              | 3.14 | 88.7 | 24.9 | 1520                      | 67.8  | 5.29 | 50.2 | 111 | 3.76 |
|            | 12.4 | 4.5           | 10.4  | 1950                      | 81.3 | 53.5 | 0.66              | 3.32 | 92.5 | 24.5 | 2100                      | 69.9  | 4.88 | 53.3 | 101 | 4.20 |
|            | 16.5 | 7.0           | 16.2  | 1450                      | 78.6 | 46.1 | 0.59              | 3.04 | 88.8 | 25.8 | 1520                      | 69.8  | 5.33 | 51.9 | 112 | 3.84 |
|            | 16.5 | 7.0           | 16.2  | 1950                      | 81.7 | 53.6 | 0.66              | 3.22 | 92.6 | 25.4 | 2100                      | 71.9  | 4.92 | 55.2 | 102 | 4.28 |
| 60         | 8.3  | 1.7           | 3.9   | 1450                      | 74.4 | 45.1 | 0.61              | 3.71 | 86.9 | 20.1 | 1520                      | 72.4  | 5.38 | 54.3 | 114 | 3.94 |
|            | 8.3  | 1.7           | 3.9   | 1950                      | 77.3 | 52.5 | 0.68              | 3.92 | 90.7 | 19.7 | 2100                      | 74.6  | 4.97 | 57.7 | 103 | 4.40 |
|            | 12.4 | 4.0           | 9.2   | 1450                      | 76.6 | 45.7 | 0.60              | 3.45 | 88.2 | 22.2 | 1520                      | 76.4  | 5.47 | 57.9 | 117 | 4.09 |
|            | 12.4 | 4.0           | 9.2   | 1950                      | 79.6 | 53.1 | 0.67              | 3.65 | 92.0 | 21.8 | 2100                      | 78.8  | 5.06 | 61.6 | 105 | 4.57 |
|            | 16.5 | 6.4           | 14.8  | 1450                      | 77.4 | 45.9 | 0.59              | 3.33 | 88.6 | 23.2 | 1520                      | 78.7  | 5.52 | 60.0 | 118 | 4.18 |
|            | 16.5 | 6.4           | 14.8  | 1950                      | 80.5 | 53.4 | 0.66              | 3.52 | 92.4 | 22.8 | 2100                      | 81.1  | 5.10 | 63.7 | 106 | 4.66 |
| 70         | 8.3  | 1.7           | 3.9   | 1450                      | 70.7 | 44.0 | 0.62              | 4.10 | 84.7 | 17.2 | 1520                      | 80.4  | 5.56 | 61.5 | 119 | 4.24 |
|            | 8.3  | 1.7           | 3.9   | 1950                      | 73.5 | 51.2 | 0.70              | 4.34 | 88.3 | 16.9 | 2100                      | 82.9  | 5.14 | 65.4 | 107 | 4.73 |
|            | 12.4 | 4.0           | 9.2   | 1450                      | 73.5 | 44.8 | 0.61              | 3.81 | 86.4 | 19.3 | 1520                      | 85.0  | 5.67 | 65.7 | 122 | 4.39 |
|            | 12.4 | 4.0           | 9.2   | 1950                      | 76.4 | 52.1 | 0.68              | 4.03 | 90.1 | 18.9 | 2100                      | 87.7  | 5.24 | 69.8 | 109 | 4.90 |
|            | 16.5 | 6.3           | 14.6  | 1450                      | 74.7 | 45.2 | 0.60              | 3.68 | 87.1 | 20.3 | 1520                      | 87.5  | 5.73 | 67.9 | 123 | 4.47 |
|            | 16.5 | 6.3           | 14.6  | 1950                      | 77.7 | 52.6 | 0.68              | 3.89 | 90.9 | 20.0 | 2100                      | 90.2  | 5.30 | 72.1 | 110 | 4.99 |
| 80         | 8.3  | 1.6           | 3.7   | 1450                      | 66.6 | 42.5 | 0.64              | 4.56 | 82.1 | 14.6 | 1520                      | 88.4  | 5.76 | 68.7 | 124 | 4.50 |
|            | 8.3  | 1.6           | 3.7   | 1950                      | 69.2 | 49.5 | 0.71              | 4.82 | 85.7 | 14.3 | 2100                      | 91.2  | 5.32 | 73.0 | 110 | 5.02 |
|            | 12.4 | 3.8           | 8.8   | 1450                      | 69.5 | 43.6 | 0.63              | 4.23 | 83.9 | 16.4 | 1520                      | 93.3  | 5.89 | 73.0 | 127 | 4.65 |
|            | 12.4 | 3.8           | 8.8   | 1950                      | 72.3 | 50.7 | 0.70              | 4.48 | 87.5 | 16.1 | 2100                      | 96.2  | 5.44 | 77.6 | 112 | 5.18 |
|            | 16.5 | 6.1           | 14.1  | 1450                      | 71.0 | 44.0 | 0.62              | 4.08 | 84.8 | 17.4 | 1520                      | 96.0  | 5.97 | 75.3 | 128 | 4.71 |
|            | 16.5 | 6.1           | 14.1  | 1950                      | 73.8 | 51.2 | 0.69              | 4.31 | 88.5 | 17.1 | 2100                      | 98.9  | 5.51 | 80.1 | 114 | 5.26 |
| 85         | 8.3  | 1.6           | 3.7   | 1450                      | 64.4 | 41.7 | 0.65              | 4.82 | 80.9 | 13.4 | 1520                      | 92.3  | 5.86 | 72.1 | 126 | 4.61 |
|            | 8.3  | 1.6           | 3.7   | 1950                      | 67.0 | 48.5 | 0.72              | 5.10 | 84.4 | 13.1 | 2100                      | 95.1  | 5.42 | 76.6 | 112 | 5.15 |
|            | 12.4 | 3.8           | 8.7   | 1450                      | 67.4 | 42.8 | 0.63              | 4.48 | 82.6 | 15.0 | 1520                      | 97.2  | 6.01 | 76.4 | 129 | 4.74 |
|            | 12.4 | 3.8           | 8.7   | 1950                      | 70.0 | 49.8 | 0.71              | 4.74 | 86.2 | 14.8 | 2100                      | 100.2 | 5.55 | 81.2 | 114 | 5.29 |
|            | 16.5 | 6.0           | 13.9  | 1450                      | 68.8 | 43.3 | 0.63              | 4.31 | 83.5 | 16.0 | 1520                      | 99.8  | 6.09 | 78.6 | 131 | 4.80 |
|            | 16.5 | 6.0           | 13.9  | 1950                      | 71.6 | 50.4 | 0.70              | 4.56 | 87.1 | 15.7 | 2100                      | 102.9 | 5.63 | 83.6 | 115 | 5.35 |
| 90         | 8.3  | 1.6           | 3.7   | 1450                      | 62.3 | 40.8 | 0.65              | 5.09 | 79.7 | 12.2 | 1520                      | 96.1  | 5.97 | 75.5 | 129 | 4.72 |
|            | 8.3  | 1.6           | 3.7   | 1950                      | 64.8 | 47.5 | 0.73              | 5.38 | 83.2 | 12.0 | 2100                      | 99.1  | 5.52 | 80.2 | 114 | 5.26 |
|            | 12.4 | 3.7           | 8.5   | 1450                      | 65.2 | 42.0 | 0.64              | 4.72 | 81.3 | 13.8 | 1520                      | 101.1 | 6.13 | 79.8 | 132 | 4.83 |
|            | 12.4 | 3.7           | 8.5   | 1950                      | 67.8 | 48.8 | 0.72              | 4.99 | 84.8 | 13.6 | 2100                      | 104.2 | 5.66 | 84.8 | 116 | 5.39 |
|            | 16.5 | 5.9           | 13.6  | 1450                      | 66.7 | 42.5 | 0.64              | 4.55 | 82.2 | 14.7 | 1520                      | 103.6 | 6.22 | 82.0 | 133 | 4.88 |
|            | 16.5 | 5.9           | 13.6  | 1950                      | 69.3 | 49.5 | 0.71              | 4.81 | 85.8 | 14.4 | 2100                      | 106.8 | 5.75 | 87.1 | 117 | 5.45 |
| 100        | 8.3  | 1.5           | 3.5   | 1450                      | 58.3 | 39.0 | 0.67              | 5.70 | 77.9 | 10.2 | Operation Not Recommended |       |      |      |     |      |
|            | 8.3  | 1.5           | 3.5   | 1950                      | 60.6 | 45.4 | 0.75              | 6.03 | 81.2 | 10.0 |                           |       |      |      |     |      |
|            | 12.4 | 3.5           | 8.1   | 1450                      | 60.9 | 40.2 | 0.66              | 5.29 | 79.0 | 11.5 |                           |       |      |      |     |      |
|            | 12.4 | 3.5           | 8.1   | 1950                      | 63.3 | 46.8 | 0.74              | 5.59 | 82.4 | 11.3 |                           |       |      |      |     |      |
|            | 16.5 | 5.6           | 12.9  | 1450                      | 62.3 | 40.8 | 0.65              | 5.09 | 79.7 | 12.2 |                           |       |      |      |     |      |
|            | 16.5 | 5.6           | 12.9  | 1950                      | 64.8 | 47.5 | 0.73              | 5.38 | 83.2 | 12.0 |                           |       |      |      |     |      |
| 110        | 8.3  | 1.4           | 3.2   | 1450                      | 54.9 | 37.4 | 0.68              | 6.42 | 77.0 | 8.6  |                           |       |      |      |     |      |
|            | 8.3  | 1.4           | 3.2   | 1950                      | 57.1 | 43.5 | 0.76              | 6.79 | 80.4 | 8.4  |                           |       |      |      |     |      |
|            | 12.4 | 3.3           | 7.6   | 1450                      | 57.0 | 38.4 | 0.67              | 5.94 | 77.4 | 9.6  |                           |       |      |      |     |      |
|            | 12.4 | 3.3           | 7.6   | 1950                      | 59.2 | 44.7 | 0.75              | 6.29 | 80.8 | 9.4  |                           |       |      |      |     |      |
|            | 16.5 | 5.3           | 12.2  | 1450                      | 58.2 | 39.0 | 0.67              | 5.72 | 77.8 | 10.2 |                           |       |      |      |     |      |
|            | 16.5 | 5.3           | 12.2  | 1950                      | 60.5 | 45.4 | 0.75              | 6.05 | 81.2 | 10.0 |                           |       |      |      |     |      |
| 120        | 8.3  | 1.3           | 3.0   | 1450                      | 52.8 | 36.2 | 0.69              | 7.02 | 77.0 | 7.5  |                           |       |      |      |     |      |
|            | 8.3  | 1.3           | 3.0   | 1950                      | 54.9 | 42.1 | 0.77              | 7.42 | 80.3 | 7.4  |                           |       |      |      |     |      |
|            | 12.4 | 3.2           | 7.4   | 1450                      | 54.0 | 36.9 | 0.68              | 6.71 | 77.1 | 8.0  |                           |       |      |      |     |      |
|            | 12.4 | 3.2           | 7.4   | 1950                      | 56.1 | 42.9 | 0.77              | 7.09 | 80.4 | 7.9  |                           |       |      |      |     |      |
|            | 16.5 | 5.1           | 11.8  | 1450                      | 54.8 | 37.3 | 0.68              | 6.49 | 77.2 | 8.5  |                           |       |      |      |     |      |
|            | 16.5 | 5.1           | 11.8  | 1950                      | 57.0 | 43.5 | 0.76              | 6.86 | 80.5 | 8.3  |                           |       |      |      |     |      |

### LEGEND

|       |   |   |
|-------|---|---|
| AHRI  | — | Air Conditioning, Heating and Refrigeration Institute |
| COP   | — | Coefficient of Performance                            |
| db    | — | Dry Bulb  |
| EER   | — | Energy Efficiency Ratio                               |
| EWT   | — | Entering Water Temperature                            |
| GPM   | — | Gallons Per Minute                                    |
| HE    | — | Heat of Extraction (MBtuh)                            |
| ISO   | — | International Organization for Standardization        |
| LAT   | — | Leaving Air Temperature (F)                           |
| MBtuh | — | Btuh in Thousands                                     |
| TC    | — | Total Capacity (MBtuh)                                |
| THC   | — | Total Heating Capacity (MBtuh)                        |
| THR   | — | Total Heat Rejection (MBtuh)                          |
| TSC   | — | Total Sensible Capacity (MBtuh)                       |
| wb    | — | Wet Bulb  |

### NOTES:

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- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Operation below 40 F EWT is based upon a 15% antifreeze solution.
- Operation below 60 F EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- For operation in the gray shaded area when water is used instead of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level so that the LWT is maintained above 40 F when the JW3 jumper is not clipped. Because the refrigerant temperature can potentially reach as low as 32 F with 40 F LWT, a nuisance cutout could occur due to the activation of the low temperature protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

# Performance data (cont)



## ENTERING AIR CORRECTION TABLE

| HEATING CORRECTIONS |                  |        |             |
|---------------------|------------------|--------|-------------|
| Ent Air DB (F)      | Heating Capacity | Power  | Heat of Ext |
| 45                  | 1.0514           | 0.7749 | 1.1240      |
| 50                  | 1.0426           | 0.8113 | 1.1032      |
| 55                  | 1.0329           | 0.8525 | 1.0802      |
| 60                  | 1.0224           | 0.8980 | 1.0551      |
| 65                  | 1.0114           | 0.9473 | 1.0282      |
| 68                  | 1.0046           | 0.9786 | 1.0115      |
| 70                  | 1.0000           | 1.0000 | 1.0000      |
| 75                  | 0.9883           | 1.0556 | 0.9706      |
| 80                  | 0.9764           | 1.1135 | 0.9404      |

| FULL LOAD COOLING CORRECTIONS 400 CFM PER TON |                              |   |        |        |        |        |        |        |        |        |     |        |        |
|---|------------------------------|---|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|--------|
| Ent Air<br>WB (F)                             | Total<br>Cooling<br>Capacity | Sensible Cooling Capacity Multipliers — Entering DB (F) |        |        |        |        |        |        |        |        |     | Power  | THR    |
|   |                              | 60  | 65     | 70     | 75     | 80     | 80.6   | 85     | 90     | 95     | 100 |        |        |
| 50  | 0.7432                       | 0.9111  | *      | *      | *      | *      | *      | *      | *      | *      | *   | 0.9866 | 0.7901 |
| 55  | 0.8202                       | 0.7709  | 0.8820 | 1.0192 | *      | *      | *      | *      | *      | *      | *   | 0.9887 | 0.8527 |
| 60  | 0.8960                       |   | 0.6702 | 0.8540 | 1.0473 | *      | *      | *      | *      | *      | *   | 0.9924 | 0.9146 |
| 65  | 0.9705                       |   |        | 0.6491 | 0.8657 | 1.0809 | 1.1066 | *      | *      | *      | *   | 0.9975 | 0.9757 |
| 66.2  | 0.9882                       |   |        | 0.5939 | 0.8152 | 1.0333 | 1.0592 | 1.2481 | *      | *      | *   | 0.9990 | 0.9903 |
| 67  | 1.0000                       |   |        | 0.5559 | 0.7801 | 1.0000 | 1.0261 | 1.2158 | *      | *      | *   | 1.0000 | 1.0000 |
| 70  | 1.0438                       |   |        |        | 0.6377 | 0.8645 | 0.8913 | 1.0847 | 1.2983 | *      | *   | 1.0042 | 1.0362 |
| 75  | 1.1159                       |   |        |        |        | 0.6008 | 0.6289 | 0.8323 | 1.0578 | 1.2773 | *   | 1.0123 | 1.0959 |

\*Sensible capacity equals total capacity.

**Ent** — Entering **THR** — Total Heat of Rejection  
**Ext** — Extraction **WB** — Wet Bulb  
**DB** — Dry Bulb

## AIRFLOW CORRECTION TABLE ECM AIRFLOW

| % OF RATED | HEATING                   |        |             | COOLING        |                   |                          |        |        |
|------------|---------------------------|--------|-------------|----------------|-------------------|--------------------------|--------|--------|
|            | Heating Capacity          | Power  | Heat of Ext | Total Capacity | Sensible Capacity | Sensible Capacity Ratio* | Power  | THR    |
| 68.75      | Operation not recommended |        |             | 0.9470         | 0.8265            | 0.8727                   | 0.9363 | 0.9449 |
| 75.00      | 0.9700                    | 1.0822 | 0.9410      | 0.9619         | 0.8593            | 0.8933                   | 0.9455 | 0.9587 |
| 81.25      | 0.9775                    | 1.0536 | 0.9579      | 0.9747         | 0.8943            | 0.9175                   | 0.9564 | 0.9711 |
| 87.50      | 0.9851                    | 1.0304 | 0.9733      | 0.9853         | 0.9302            | 0.9441                   | 0.9691 | 0.9821 |
| 93.75      | 0.9925                    | 1.0125 | 0.9874      | 0.9938         | 0.9659            | 0.9719                   | 0.9837 | 0.9918 |
| 100.00     | 1.0000                    | 1.0000 | 1.0000      | 1.0000         | 1.0000            | 1.0000                   | 1.0000 | 1.0000 |
| 106.25     | 1.0074                    | 0.9928 | 1.0112      | 1.0041         | 1.0313            | 1.0271                   | 1.0181 | 1.0069 |
| 112.50     | 1.0148                    | 0.9909 | 1.0210      | 1.0060         | 1.0584            | 1.0522                   | 1.0381 | 1.0123 |
| 118.75     | 1.0222                    | 0.9622 | 1.0377      | 1.0070         | 1.0815            | 1.0740                   | 1.0598 | 1.0174 |
| 125.00     | 1.0295                    | 0.8681 | 1.0712      | 1.0076         | 1.0998            | 1.0916                   | 1.0834 | 1.0225 |
| 130.00     | 1.0354                    | 0.8456 | 1.0844      | 1.0083         | 1.1110            | 1.1018                   | 1.1035 | 1.0271 |

### LEGEND

**Ext** — Extraction  
**THR** — Total Heat of Rejection

\*Sensible Capacity Ratio = Sensible Capacity/Total Capacity.

## PSC AIRFLOW

| % OF RATED | HEATING                   |        |             | COOLING        |                   |                          |        |        |
|------------|---------------------------|--------|-------------|----------------|-------------------|--------------------------|--------|--------|
|            | Heating Capacity          | Power  | Heat of Ext | Total Capacity | Sensible Capacity | Sensible Capacity Ratio* | Power  | THR    |
| 68.75      | Operation not recommended |        |             | 0.9465         | 0.8019            | 0.8472                   | 0.9614 | 0.9496 |
| 75.00      | 0.9740                    | 1.0936 | 0.9425      | 0.9602         | 0.8350            | 0.8696                   | 0.9675 | 0.9617 |
| 81.25      | 0.9810                    | 1.0635 | 0.9592      | 0.9724         | 0.8733            | 0.8981                   | 0.9744 | 0.9728 |
| 87.50      | 0.9876                    | 1.0379 | 0.9744      | 0.9831         | 0.9149            | 0.9306                   | 0.9821 | 0.9829 |
| 93.75      | 0.9940                    | 1.0167 | 0.9880      | 0.9923         | 0.9578            | 0.9653                   | 0.9906 | 0.9920 |
| 100.00     | 1.0000                    | 1.0000 | 1.0000      | 1.0000         | 1.0000            | 1.0000                   | 1.0000 | 1.0000 |
| 106.25     | 1.0057                    | 0.9878 | 1.0105      | 1.0062         | 1.0392            | 1.0328                   | 1.0102 | 1.0070 |
| 112.50     | 1.0112                    | 0.9800 | 1.0194      | 1.0109         | 1.0733            | 1.0617                   | 1.0211 | 1.0130 |
| 118.75     | 1.0163                    | 0.9705 | 1.0284      | 1.0141         | 1.1001            | 1.0848                   | 1.0329 | 1.0180 |
| 125.00     | 1.0211                    | 0.9614 | 1.0368      | 1.0159         | 1.1174            | 1.0999                   | 1.0455 | 1.0220 |
| 130.00     | 1.0247                    | 0.9554 | 1.0430      | 1.0161         | 1.1229            | 1.1050                   | 1.0562 | 1.0244 |

### LEGEND

**Ext** — Extraction  
**THR** — Total Heat of Rejection

\*Sensible Capacity Ratio = Sensible Capacity/Total Capacity.

## PSC BLOWER MOTOR PERFORMANCE DATA — NO REHEAT

| 50PS<br>UNIT<br>SIZE | RATED<br>AIRFLOW<br>(cfm) | MIN<br>CFM | FAN<br>SPEED | AIRFLOW (cfm) AT EXTERNAL STATIC PRESSURE (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------------|---------------------------|------------|--------------|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                      |                           |            |              | 0.00   | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| 006                  | 240                       | 150        | HI           | 317  | 310  | 305  | 295  | 285  | 279  | 271  | 261  | 250  | 241  | 230  | 203  | 168  |      |      |      |
|                      |                           |            | MED          | 260  | 253  | 245  | 238  | 230  | 222  | 214  | 202  | 190  | 180  | 167  |      |      |      |      |      |
|                      |                           |            | LO           | 216  | 206  | 201  | 196  | 189  | 177  | 156  |      |      |      |      |      |      |      |      |      |
| 009                  | 300                       | 225        | HI           | 393  | 386  | 378  | 371  | 364  | 355  | 346  | 337  | 325  | 283  | 253  |      |      |      |      |      |
|                      |                           |            | MED          | 366  | 360  | 353  | 347  | 341  | 334  | 326  | 318  | 310  | 262  | 230  |      |      |      |      |      |
|                      |                           |            | LO           | 326  | 321  | 316  | 309  | 303  | 297  | 290  | 283  | 274  | 236  |      |      |      |      |      |      |
| 012                  | 350                       | 300        | HI           | 520  | 510  | 500  | 488  | 479  | 466  | 453  | 441  | 403  | 375  | 347  | 312  |      |      |      |      |
|                      |                           |            | MED          | 459  | 453  | 447  | 437  | 428  | 420  | 411  | 400  | 368  | 344  | 317  |      |      |      |      |      |
|                      |                           |            | LO           | 371  | 370  | 368  | 363  | 358  | 353  | 345  | 340  | 315  |      |      |      |      |      |      |      |
| 018                  | 600                       | 450        | HI           | 704  | 708  | 711  | 702  | 693  | 692  | 690  | 683  | 675  | 658  | 640  | 598  | 515  |      |      |      |
|                      |                           |            | MED          | 602  | 601  | 599  | 590  | 581  | 583  | 585  | 579  | 573  | 560  | 547  | 492  |      |      |      |      |
|                      |                           |            | LO           | 531  | 529  | 527  | 522  | 517  | 512  | 506  | 501  | 495  | 479  | 462  |      |      |      |      |      |
|                      |                           |            | HS HI        | 894  | 886  | 877  | 859  | 841  | 827  | 812  | 786  | 760  | 744  | 728  | 659  |      |      |      |      |
|                      |                           |            | HS MED       | 765  | 760  | 755  | 747  | 738  | 725  | 711  | 690  | 668  | 654  | 640  | 602  |      |      |      |      |
|                      |                           |            | HS LO        | 683  | 672  | 661  | 649  | 636  | 616  | 596  | 584  | 571  | 560  | 549  |      |      |      |      |      |
| 024                  | 850                       | 600        | HI           | 965  | 960  | 954  | 943  | 931  | 923  | 914  | 898  | 882  | 862  | 842  | 794  | 725  | 635  |      |      |
|                      |                           |            | MED          | 841  | 833  | 825  | 817  | 809  | 800  | 790  | 777  | 763  | 747  | 731  | 686  | 623  |      |      |      |
|                      |                           |            | LO           | 723  | 715  | 707  | 703  | 698  | 689  | 680  | 668  | 656  | 642  | 627  |      |      |      |      |      |
|                      |                           |            | HS HI        | 1271   | 1250 | 1229 | 1207 | 1185 | 1164 | 1143 | 1118 | 1093 | 1061 | 1029 | 953  | 875  | 753  |      |      |
|                      |                           |            | HS MED       | 1048   | 1037 | 1025 | 1016 | 1007 | 994  | 981  | 962  | 943  | 915  | 886  | 822  | 731  | 626  |      |      |
|                      |                           |            | HS LO        | 890  | 887  | 884  | 879  | 874  | 865  | 855  | 842  | 829  | 809  | 789  | 726  | 660  |      |      |      |
| 030                  | 950                       | 750        | HI           | 1271   | 1250 | 1229 | 1207 | 1185 | 1164 | 1143 | 1118 | 1093 | 1061 | 1029 | 953  | 875  | 753  |      |      |
|                      |                           |            | MED          | 1048   | 1037 | 1025 | 1016 | 1007 | 994  | 981  | 962  | 943  | 915  | 886  | 822  | 731  | 626  |      |      |
|                      |                           |            | LO           | 890  | 887  | 884  | 879  | 874  | 865  | 855  | 842  | 829  | 809  | 789  | 726  | 660  |      |      |      |
|                      |                           |            | HS HI        | 1439   | 1411 | 1383 | 1355 | 1327 | 1297 | 1266 | 1232 | 1198 | 1160 | 1122 | 1041 | 943  | 830  |      |      |
|                      |                           |            | HS MED       | 1186   | 1174 | 1162 | 1151 | 1140 | 1126 | 1112 | 1089 | 1065 | 1039 | 1013 | 946  | 870  | 762  |      |      |
|                      |                           |            | HS LO        | 1039   | 1038 | 1036 | 1028 | 1020 | 1009 | 997  | 983  | 968  | 946  | 923  | 866  | 798  |      |      |      |
| 036                  | 1250                      | 900        | HI           | 1411   | 1407 | 1402 | 1390 | 1378 | 1370 | 1361 | 1326 | 1290 | 1248 | 1205 | 1083 | 942  |      |      |      |
|                      |                           |            | MED          | 1171   | 1164 | 1156 | 1145 | 1133 | 1113 | 1092 | 1064 | 1035 | 997  | 958  |      |      |      |      |      |
|                      |                           |            | LO           | 983  | 967  | 950  | 943  | 936  | 936  |      |      |      |      |      |      |      |      |      |      |
|                      |                           |            | HS HI        | 1648   | 1633 | 1617 | 1597 | 1576 | 1557 | 1537 | 1493 | 1448 | 1397 | 1345 | 1207 | 1051 | 957  |      |      |
|                      |                           |            | HS MED       | 1344   | 1335 | 1325 | 1312 | 1299 | 1276 | 1253 | 1220 | 1186 | 1143 | 1099 | 1007 | 903  |      |      |      |
|                      |                           |            | HS LO        | 1141   | 1128 | 1115 | 1106 | 1097 | 1077 | 1057 | 1031 | 1005 | 966  | 926  |      |      |      |      |      |
| 042                  | 1400                      | 1050       | HI           | 1634   | 1626 | 1618 | 1606 | 1594 | 1583 | 1571 | 1539 | 1507 | 1464 | 1420 | 1265 | 1078 |      |      |      |
|                      |                           |            | MED          | 1332   | 1323 | 1314 | 1298 | 1282 | 1263 | 1243 | 1206 | 1169 | 1115 | 1060 |      |      |      |      |      |
|                      |                           |            | LO           | 1130   | 1109 | 1088 | 1086 | 1084 | 1066 | 1048 | 1052 | 1055 |      |      |      |      |      |      |      |
|                      |                           |            | HS HI        | 1798   | 1781 | 1764 | 1738 | 1711 | 1688 | 1665 | 1630 | 1595 | 1555 | 1514 | 1420 | 1239 |      |      |      |
|                      |                           |            | HS MED       | 1384   | 1382 | 1379 | 1375 | 1371 | 1356 | 1341 | 1318 | 1294 | 1261 | 1227 |      |      |      |      |      |
|                      |                           |            | HS LO        | 1091   | 1088 | 1084 | 1081 | 1078 | 1069 | 1060 |      |      |      |      |      |      |      |      |      |
| 048                  | 1600                      | 1200       | HI           | 1798   | 1781 | 1764 | 1738 | 1711 | 1688 | 1665 | 1630 | 1595 | 1555 | 1514 | 1420 | 1239 |      |      |      |
|                      |                           |            | MED          | 1384   | 1382 | 1379 | 1375 | 1371 | 1356 | 1341 | 1318 | 1294 | 1261 | 1227 |      |      |      |      |      |
|                      |                           |            | LO           |  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                      |                           |            | HS HI        | 2011   | 1977 | 1942 | 1923 | 1903 | 1841 | 1778 | 1755 | 1732 | 1689 | 1645 | 1520 | 1431 | 1307 | 1211 |      |
|                      |                           |            | HS MED       | 1881   | 1858 | 1834 | 1807 | 1780 | 1746 | 1711 | 1676 | 1640 | 1604 | 1567 | 1469 | 1378 | 1286 |      |      |
|                      |                           |            | HS LO        | 1738   | 1716 | 1694 | 1673 | 1651 | 1634 | 1617 | 1584 | 1551 | 1508 | 1465 | 1390 | 1321 | 1228 |      |      |
| 060                  | 1950                      | 1500       | HI           | 2311   | 2306 | 2300 | 2290 | 2279 | 2268 | 2257 | 2233 | 2209 | 2175 | 2140 | 2088 | 1990 | 1901 | 1856 | 1752 |
|                      |                           |            | MED          | 2058   | 2049 | 2039 | 2028 | 2016 | 2000 | 1983 | 1966 | 1949 | 1935 | 1920 | 1874 | 1807 | 1750 | 1670 | 1582 |
|                      |                           |            | LO           | 1868   | 1863 | 1858 | 1858 | 1858 | 1848 | 1838 | 1822 | 1806 | 1799 | 1792 | 1749 | 1699 | 1636 | 1570 |      |
|                      |                           |            | HS HI        | 2510   | 2498 | 2486 | 2471 | 2455 | 2440 | 2424 | 2401 | 2377 | 2348 | 2318 | 2247 | 2161 | 2078 | 1986 | 1855 |
|                      |                           |            | HS MED       | 2171   | 2167 | 2162 | 2162 | 2162 | 2158 | 2153 | 2135 | 2117 | 2101 | 2085 | 2024 | 1971 | 1891 | 1823 | 1691 |
|                      |                           |            | HS LO        | 2010   | 2008 | 2006 | 2006 | 2006 | 2006 | 2006 | 1992 | 1977 | 1962 | 1947 | 1892 | 1851 | 1782 | 1705 | 1600 |
| 070                  | 2100                      | 1800       | HI           | 2510   | 2498 | 2486 | 2471 | 2455 | 2440 | 2424 | 2401 | 2377 | 2348 | 2318 | 2247 | 2161 | 2078 | 1986 | 1855 |
|                      |                           |            | MED          | 2171   | 2167 | 2162 | 2162 | 2162 | 2158 | 2153 | 2135 | 2117 | 2101 | 2085 | 2024 | 1971 | 1891 | 1823 |      |
|                      |                           |            | LO           | 2010   | 2008 | 2006 | 2006 | 2006 | 2006 | 2006 | 1992 | 1977 | 1962 | 1947 | 1892 | 1851 |      |      |      |

### LEGEND

ESP — External Static Pressure  
HS — High Static

### NOTES:

1. Shaded areas denote ESP where operation is not recommended.
2. Units factory shipped on medium speed. Other speeds require field selection.
3. All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g., 208 v for 208/230 v units.
4. Only two-speed fan (high and medium) available on 575 v units.

# Performance data (cont)



**ANTIFREEZE AND WATER PRESSURE DROP (WPD) ADDER FOR OPTIONS CORRECTION TABLE**

| ANTIFREEZE TYPE  | ANTIFREEZE % | COOLING        |                   |       | HEATING          |       | WPD CORRECTION FACTOR EWT 30 F |
|------------------|--------------|----------------|-------------------|-------|------------------|-------|--------------------------------|
|                  |              | EWT 90 F       |                   |       | EWT 30 F         |       |                                |
|                  |              | Total Capacity | Sensible Capacity | Power | Heating Capacity | Power |                                |
| WATER            | 0            | 1.000          | 1.000             | 1.000 | 1.000            | 1.000 | 1.000                          |
| PROPYLENE GLYCOL | 5            | 0.995          | 0.995             | 1.003 | 0.989            | 0.997 | 1.070                          |
|                  | 15           | 0.986          | 0.986             | 1.009 | 0.986            | 0.990 | 1.210                          |
|                  | 25           | 0.978          | 0.978             | 1.014 | 0.947            | 0.983 | 1.360                          |
| METHANOL         | 5            | 0.997          | 0.997             | 1.002 | 0.989            | 0.997 | 1.070                          |
|                  | 15           | 0.990          | 0.990             | 1.007 | 0.968            | 0.990 | 1.160                          |
|                  | 25           | 0.982          | 0.982             | 1.012 | 0.949            | 0.984 | 1.220                          |
| ETHANOL          | 5            | 0.998          | 0.998             | 1.002 | 0.981            | 0.994 | 1.140                          |
|                  | 15           | 0.994          | 0.994             | 1.005 | 0.944            | 0.983 | 1.300                          |
|                  | 25           | 0.986          | 0.986             | 1.009 | 0.917            | 0.974 | 1.360                          |
| ETHYLENE GLYCOL  | 5            | 0.998          | 0.998             | 1.002 | 0.993            | 0.998 | 1.040                          |
|                  | 15           | 0.994          | 0.994             | 1.004 | 0.980            | 0.994 | 1.120                          |
|                  | 25           | 0.988          | 0.988             | 1.008 | 0.966            | 0.990 | 1.200                          |

**MOTORIZED VALVE OPTION CORRECTIONS TABLE**

| UNIT SIZE | Cv   | MOPD | WATER PRESSURE DROP ADDERS |      |      |
|-----------|------|------|----------------------------|------|------|
|           |      |      | GPM                        | PSI  | FT   |
| 006       | 4.9  | 150  | 1.0                        | 0.04 | 0.10 |
|           | 4.9  | 150  | 1.5                        | 0.09 | 0.22 |
|           | 4.9  | 150  | 2.0                        | 0.17 | 0.38 |
| 009       | 4.9  | 150  | 1.4                        | 0.08 | 0.19 |
|           | 4.9  | 150  | 2.1                        | 0.18 | 0.42 |
|           | 4.9  | 150  | 2.8                        | 0.33 | 0.75 |
| 012       | 4.9  | 150  | 1.8                        | 0.13 | 0.31 |
|           | 4.9  | 150  | 2.6                        | 0.28 | 0.65 |
|           | 4.9  | 150  | 3.5                        | 0.51 | 1.18 |
| 018       | 10.3 | 125  | 2.8                        | 0.07 | 0.16 |
|           | 10.3 | 125  | 4.1                        | 0.16 | 0.37 |
|           | 10.3 | 125  | 5.5                        | 0.29 | 0.66 |
| 024       | 10.3 | 125  | 4.0                        | 0.15 | 0.35 |
|           | 10.3 | 125  | 6.0                        | 0.34 | 0.78 |
|           | 10.3 | 125  | 8.0                        | 0.60 | 1.39 |
| 030       | 10.3 | 125  | 4.0                        | 0.15 | 0.35 |
|           | 10.3 | 125  | 6.0                        | 0.34 | 0.78 |
|           | 10.3 | 125  | 8.0                        | 0.60 | 1.39 |
| 036       | 10.3 | 125  | 4.5                        | 0.19 | 0.44 |
|           | 10.3 | 125  | 6.8                        | 0.43 | 0.99 |
|           | 10.3 | 125  | 9.0                        | 0.76 | 1.76 |
| 042       | 10.3 | 125  | 5.5                        | 0.29 | 0.66 |
|           | 10.3 | 125  | 8.3                        | 0.64 | 1.48 |
|           | 10.3 | 125  | 11.0                       | 1.14 | 2.63 |
| 048       | 10.3 | 125  | 6.0                        | 0.34 | 0.78 |
|           | 10.3 | 125  | 9.0                        | 0.76 | 1.76 |
|           | 10.3 | 125  | 12.0                       | 1.36 | 3.14 |
| 060       | 10.3 | 125  | 7.5                        | 0.71 | 1.64 |
|           | 10.3 | 125  | 11.3                       | 1.60 | 3.69 |
|           | 10.3 | 125  | 15.0                       | 2.84 | 6.56 |
| 070       | 10.3 | 125  | 8.3                        | 0.86 | 1.98 |
|           | 10.3 | 125  | 12.4                       | 1.93 | 4.47 |
|           | 10.3 | 125  | 16.5                       | 3.44 | 7.94 |

**HOT WATER REHEAT OPTION CORRECTIONS TABLE  
(WHEN OPERATING IN HOT WATER REHEAT MODE)**

| UNIT SIZE | WATER PRESSURE DROP ADDERS |      |       |
|-----------|----------------------------|------|-------|
|           | GPM                        | PSI  | FT    |
| 018       | 2.8                        | 0.77 | 1.77  |
|           | 4.1                        | 1.65 | 3.80  |
| 024       | 4.0                        | 1.57 | 3.62  |
|           | 6.0                        | 3.53 | 8.14  |
| 030       | 4.0                        | 0.69 | 1.59  |
|           | 6.0                        | 1.55 | 3.58  |
| 036       | 4.5                        | 0.87 | 2.02  |
|           | 6.8                        | 1.99 | 4.60  |
| 042       | 5.5                        | 1.30 | 3.01  |
|           | 8.3                        | 6.75 | 15.58 |
| 048       | 6.0                        | 1.55 | 3.58  |
|           | 9.0                        | 3.49 | 8.06  |
| 060       | 7.5                        | 1.49 | 3.45  |
|           | 11.3                       | 3.39 | 7.82  |
| 070       | 8.3                        | 1.83 | 4.22  |
|           | 12.4                       | 4.08 | 9.42  |

### PSC BLOWER MOTOR PERFORMANCE DATA FOR 50PS UNITS WITH HWR\*

| COIL FACE<br>VELOCITY<br>FPM | REHEAT ESP LOSS PER UNIT SIZE |                     |                 |                     |                     |
|------------------------------|-------------------------------|---------------------|-----------------|---------------------|---------------------|
|                              | 018<br>(in. wg)               | 024,030<br>(in. wg) | 036<br>(in. wg) | 042,048<br>(in. wg) | 060,070<br>(in. wg) |
| 200                          | 0.037                         | 0.033               | 0.031           | 0.028               | 0.026               |
| 250                          | 0.052                         | 0.046               | 0.042           | 0.038               | 0.034               |
| 300                          | 0.077                         | 0.066               | 0.059           | 0.051               | 0.044               |
| 350                          | 0.113                         | 0.096               | 0.085           | 0.073               | 0.061               |
| 400                          | 0.181                         | 0.160               | 0.145           | 0.131               | 0.117               |
| 450                          | 0.242                         | 0.226               | 0.215           | 0.205               | 0.194               |
| 500                          | 0.360                         | 0.345               | 0.335           | 0.326               | 0.316               |

#### LEGEND

ESP — External Static Pressure  
HWR — Hot Water Reheat

\*HWR not available on 50PS006-012 units.

NOTE: For units with HWR coil applications, calculate face velocity of the entering air. From the data table, find ESP for reheat application. The loss includes wet coil loss.

### ECM BLOWER MOTOR PERFORMANCE DATA

| 50PS<br>UNIT<br>SIZE | MAX<br>ESP<br>(in. wg) | FAN<br>MOTOR<br>(hp) | TAP<br>SETTING | COOLING MODE<br>(cfm) |         |      | DEHUMIDIFICATION MODE<br>(cfm) |         |      | HEATING MODE<br>(cfm) |         |      |
|----------------------|------------------------|----------------------|----------------|-----------------------|---------|------|--------------------------------|---------|------|-----------------------|---------|------|
|                      |                        |                      |                | Stage 1               | Stage 2 | Fan  | Stage 1                        | Stage 2 | Fan  | Stage 1               | Stage 2 | Fan  |
| 018                  | 0.50                   | 1/2                  | 4              | 640                   | 800     | 400  | 500                            | 620     | 400  | 640                   | 700     | 400  |
|                      |                        |                      | 3              | 600                   | 750     | 375  | 470                            | 590     | 375  | 600                   | 750     | 375  |
|                      |                        |                      | 2              | 525                   | 650     | 330  | 400                            | 500     | 330  | 520                   | 650     | 330  |
|                      |                        |                      | 1              | 450                   | 550     | 280  | —                              | —       | —    | 450                   | 550     | 280  |
| 024                  | 0.50                   | 1/2                  | 4              | 780                   | 850     | 470  | 610                            | 740     | 470  | 870                   | 1060    | 470  |
|                      |                        |                      | 3              | 700                   | 850     | 420  | 540                            | 660     | 420  | 780                   | 950     | 420  |
|                      |                        |                      | 2              | 630                   | 770     | 360  | 490                            | 600     | 360  | 670                   | 820     | 360  |
|                      |                        |                      | 1              | 550                   | 670     | 300  | —                              | —       | —    | 570                   | 690     | 300  |
| 030                  | 0.50                   | 1/2                  | 4              | 920                   | 1130    | 560  | 720                            | 880     | 560  | 1000                  | 1230    | 560  |
|                      |                        |                      | 3              | 820                   | 1000    | 500  | 640                            | 780     | 500  | 900                   | 1100    | 500  |
|                      |                        |                      | 2              | 740                   | 900     | 450  | 580                            | 700     | 450  | 800                   | 980     | 450  |
|                      |                        |                      | 1              | 660                   | 800     | 400  | —                              | —       | —    | 700                   | 850     | 400  |
| 036                  | 0.50                   | 1/2                  | 4              | 1150                  | 1400    | 700  | 900                            | 1090    | 700  | 1150                  | 1400    | 700  |
|                      |                        |                      | 3              | 1020                  | 1250    | 630  | 800                            | 980     | 630  | 1020                  | 1250    | 630  |
|                      |                        |                      | 2              | 890                   | 1080    | 540  | 690                            | 840     | 540  | 890                   | 1080    | 540  |
|                      |                        |                      | 1              | 740                   | 900     | 450  | —                              | —       | —    | 750                   | 920     | 450  |
| 042                  | 0.50                   | 1/2                  | 4              | 1290                  | 1580    | 790  | 1010                           | 1230    | 790  | 1290                  | 1580    | 790  |
|                      |                        |                      | 3              | 1150                  | 1400    | 700  | 900                            | 1090    | 700  | 1150                  | 1400    | 700  |
|                      |                        |                      | 2              | 1050                  | 1280    | 640  | 820                            | 1000    | 640  | 1020                  | 1240    | 640  |
|                      |                        |                      | 1              | 920                   | 1120    | 560  | —                              | —       | —    | 900                   | 1080    | 560  |
| 048                  | 0.75                   | 1                    | 4              | 1420                  | 1730    | 870  | 1110                           | 1350    | 870  | 1520                  | 1850    | 865  |
|                      |                        |                      | 3              | 1270                  | 1550    | 780  | 990                            | 1210    | 780  | 1350                  | 1650    | 775  |
|                      |                        |                      | 2              | 1180                  | 1440    | 720  | 920                            | 1120    | 720  | 1190                  | 1450    | 720  |
|                      |                        |                      | 1              | 1050                  | 1280    | 640  | —                              | —       | —    | 1020                  | 1250    | 640  |
| 060                  | 0.75                   | 1                    | 4              | 1680                  | 2050    | 1030 | 1310                           | 1600    | 1030 | 1870                  | 2280    | 1030 |
|                      |                        |                      | 3              | 1500                  | 1830    | 910  | 1170                           | 1420    | 910  | 1680                  | 2050    | 910  |
|                      |                        |                      | 2              | 1400                  | 1700    | 850  | 1090                           | 1330    | 850  | 1480                  | 1800    | 850  |
|                      |                        |                      | 1              | 1300                  | 1580    | 790  | —                              | —       | —    | 1270                  | 1550    | 790  |
| 070                  | 0.75                   | 1                    | 4              | 1830                  | 2230    | 1100 | 1420                           | 1740    | 1100 | 1830                  | 2230    | 1100 |
|                      |                        |                      | 3              | 1600                  | 1950    | 980  | 1250                           | 1520    | 980  | 1720                  | 2100    | 980  |
|                      |                        |                      | 2              | 1440                  | 1750    | 880  | 1120                           | 1360    | 880  | 1670                  | 1950    | 880  |
|                      |                        |                      | 1              | 1200                  | 1580    | 790  | —                              | —       | —    | 1460                  | 1780    | 790  |

#### LEGEND

ESP — External Static Pressure

#### NOTES:

- See ECM control section in the Base Unit Installation Instructions for details on setting taps.
- Factory setting is Tap Setting 2.
- Airflow is controlled within 5% up to the Max ESP shown with wet coil.
- Do not select Dehumidification mode if Tap Setting is on Setting 1.
- All units AHRI/ISO 13256-1 rated Tap Setting 3.
- Airflow in cfm with wet coil and clean air filter.
- Units have an ECM fan motor as a standard feature. The small additional pressure drop of the reheat coil causes the ECM motor to slightly increase rpm to overcome the added pressure drop and maintain selected cfm up to maximum ESP.

# Performance data (cont)



## SOUND DATA — DUCTED DISCHARGE WITH STANDARD CONSTRUCTION

| 50PS UNIT | MODE                 | DUCTED DISCHARGE OCTAVE BAND FREQUENCY, Hz |     |     |      |      |      |      |
|-----------|----------------------|--|-----|-----|------|------|------|------|
|           |                      | 125  | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| 006       | Fan Only: Low Speed  | 54   | 45  | 37  | 36   | 31   | 30   | 33   |
|           | Fan Only: High Speed | 61   | 56  | 45  | 45   | 41   | 39   | 35   |
|           | Cooling: Low Speed   | 52   | 43  | 37  | 35   | 29   | 30   | 34   |
|           | Cooling: High Speed  | 61   | 54  | 45  | 45   | 40   | 38   | 35   |
|           | Heating: Low Speed   | 57   | 48  | 41  | 40   | 34   | 31   | 33   |
|           | Heating: High Speed  | 62   | 55  | 46  | 46   | 42   | 39   | 35   |
| 009       | Fan Only: Low Speed  | 58   | 54  | 48  | 47   | 43   | 41   | 36   |
|           | Fan Only: High Speed | 61   | 56  | 51  | 51   | 46   | 44   | 39   |
|           | Cooling: Low Speed   | 61   | 54  | 48  | 47   | 43   | 41   | 36   |
|           | Cooling: High Speed  | 64   | 57  | 51  | 51   | 46   | 45   | 40   |
|           | Heating: Low Speed   | 60   | 55  | 49  | 48   | 43   | 41   | 36   |
|           | Heating: High Speed  | 64   | 58  | 51  | 51   | 47   | 45   | 39   |
| 012       | Fan Only: Low Speed  | 63   | 57  | 51  | 53   | 48   | 46   | 42   |
|           | Fan Only: High Speed | 64   | 61  | 54  | 57   | 53   | 51   | 47   |
|           | Cooling: Low Speed   | 64   | 57  | 51  | 52   | 48   | 46   | 41   |
|           | Cooling: High Speed  | 67   | 63  | 54  | 58   | 53   | 52   | 48   |
|           | Heating: Low Speed   | 63   | 57  | 51  | 53   | 49   | 47   | 42   |
|           | Heating: High Speed  | 66   | 62  | 54  | 58   | 53   | 52   | 48   |
| 018       | Fan Only: Low Speed  | 48   | 51  | 49  | 46   | 42   | 42   | 33   |
|           | Fan Only: High Speed | 52   | 56  | 62  | 54   | 51   | 52   | 45   |
|           | Cooling: Low Speed   | 49   | 50  | 45  | 45   | 43   | 42   | 32   |
|           | Cooling: High Speed  | 51   | 55  | 61  | 53   | 50   | 50   | 42   |
|           | Heating: Low Speed   | 50   | 50  | 51  | 46   | 43   | 42   | 33   |
|           | Heating: High Speed  | 51   | 57  | 61  | 54   | 50   | 51   | 44   |
| 024       | Fan Only: Low Speed  | 52   | 55  | 56  | 52   | 48   | 48   | 40   |
|           | Fan Only: High Speed | 57   | 61  | 65  | 60   | 56   | 57   | 51   |
|           | Cooling: Low Speed   | 52   | 54  | 55  | 51   | 48   | 48   | 39   |
|           | Cooling: High Speed  | 56   | 60  | 65  | 59   | 56   | 56   | 50   |
|           | Heating: Low Speed   | 54   | 55  | 57  | 52   | 48   | 48   | 40   |
|           | Heating: High Speed  | 56   | 61  | 65  | 60   | 56   | 56   | 50   |
| 030       | Fan Only: Low Speed  | 57   | 59  | 63  | 57   | 54   | 54   | 47   |
|           | Fan Only: High Speed | 62   | 66  | 69  | 66   | 62   | 62   | 57   |
|           | Cooling: Low Speed   | 56   | 58  | 64  | 56   | 53   | 53   | 46   |
|           | Cooling: High Speed  | 61   | 66  | 69  | 65   | 62   | 62   | 57   |
|           | Heating: Low Speed   | 59   | 59  | 63  | 57   | 54   | 53   | 47   |
|           | Heating: High Speed  | 61   | 66  | 68  | 65   | 61   | 61   | 56   |
| 036       | Fan Only: Low Speed  | 57   | 55  | 57  | 53   | 48   | 46   | 37   |
|           | Fan Only: High Speed | 71   | 69  | 68  | 68   | 63   | 62   | 54   |
|           | Cooling: Low Speed   | 59   | 55  | 56  | 53   | 49   | 47   | 38   |
|           | Cooling: High Speed  | 70   | 69  | 68  | 67   | 63   | 63   | 56   |
|           | Heating: Low Speed   | 59   | 56  | 57  | 53   | 49   | 46   | 40   |
|           | Heating: High Speed  | 70   | 69  | 68  | 67   | 62   | 60   | 53   |
| 042       | Fan Only: Low Speed  | 60   | 57  | 59  | 55   | 50   | 49   | 40   |
|           | Fan Only: High Speed | 71   | 70  | 69  | 69   | 64   | 64   | 57   |
|           | Cooling: Low Speed   | 61   | 57  | 68  | 54   | 51   | 50   | 41   |
|           | Cooling: High Speed  | 70   | 70  | 69  | 68   | 64   | 64   | 58   |
|           | Heating: Low Speed   | 61   | 58  | 58  | 55   | 50   | 48   | 41   |
|           | Heating: High Speed  | 70   | 70  | 69  | 68   | 60   | 62   | 55   |
| 048       | Fan Only: Low Speed  | 64   | 60  | 61  | 57   | 53   | 52   | 44   |
|           | Fan Only: High Speed | 72   | 72  | 71  | 70   | 65   | 66   | 60   |
|           | Cooling: Low Speed   | 62   | 59  | 60  | 56   | 53   | 53   | 45   |
|           | Cooling: High Speed  | 71   | 71  | 70  | 69   | 65   | 66   | 60   |
|           | Heating: Low Speed   | 63   | 60  | 59  | 56   | 52   | 51   | 42   |
|           | Heating: High Speed  | 71   | 71  | 70  | 69   | 64   | 64   | 58   |
| 060       | Fan Only: Low Speed  | 70   | 73  | 68  | 67   | 62   | 62   | 56   |
|           | Fan Only: High Speed | 74   | 72  | 70  | 72   | 68   | 68   | 63   |
|           | Cooling: Low Speed   | 69   | 74  | 68  | 66   | 61   | 62   | 56   |
|           | Cooling: High Speed  | 74   | 72  | 70  | 71   | 67   | 68   | 63   |
|           | Heating: Low Speed   | 71   | 70  | 67  | 67   | 61   | 60   | 54   |
|           | Heating: High Speed  | 72   | 72  | 69  | 71   | 67   | 67   | 61   |
| 070       | Fan Only: Low Speed  | 71   | 74  | 69  | 68   | 63   | 64   | 58   |
|           | Fan Only: High Speed | 74   | 73  | 70  | 72   | 68   | 69   | 64   |
|           | Cooling: Low Speed   | 72   | 77  | 65  | 69   | 64   | 66   | 60   |
|           | Cooling: High Speed  | 76   | 74  | 72  | 74   | 70   | 71   | 66   |
|           | Heating: Low Speed   | 74   | 73  | 70  | 70   | 64   | 64   | 57   |
|           | Heating: High Speed  | 74   | 75  | 72  | 74   | 72   | 70   | 65   |

NOTE: All performance is Sound Power Level in dB referenced to 1 picoWatt.

# SOUND DATA — CASE RADIATED WITH STANDARD CONSTRUCTION

| 50PS UNIT | MODE                 | FREE AIR INLET COMBINED WITH CASING (CABINET)<br>RADIATED OCTAVE BAND FREQUENCY, Hz |     |     |      |      |      |      |
|-----------|----------------------|---|-----|-----|------|------|------|------|
|           |                      | 125   | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| 018       | Fan Only: Low Speed  | 53  | 51  | 51  | 41   | 40   | 38   | 30   |
|           | Fan Only: High Speed | 60  | 58  | 56  | 50   | 49   | 47   | 40   |
|           | Cooling: Low Speed   | 60  | 53  | 52  | 48   | 45   | 41   | 34   |
|           | Cooling: High Speed  | 62  | 58  | 58  | 54   | 53   | 48   | 42   |
|           | Heating: Low Speed   | 67  | 55  | 52  | 48   | 48   | 42   | 36   |
|           | Heating: High Speed  | 67  | 59  | 58  | 54   | 53   | 49   | 42   |
| 024       | Fan Only: Low Speed  | 58  | 55  | 55  | 46   | 44   | 43   | 35   |
|           | Fan Only: High Speed | 63  | 61  | 59  | 54   | 52   | 51   | 45   |
|           | Cooling: Low Speed   | 61  | 56  | 55  | 50   | 47   | 44   | 38   |
|           | Cooling: High Speed  | 64  | 61  | 60  | 56   | 54   | 51   | 46   |
|           | Heating: Low Speed   | 67  | 57  | 56  | 50   | 47   | 45   | 39   |
|           | Heating: High Speed  | 68  | 61  | 60  | 56   | 54   | 52   | 46   |
| 030       | Fan Only: Low Speed  | 62  | 58  | 58  | 51   | 49   | 47   | 41   |
|           | Fan Only: High Speed | 66  | 64  | 62  | 59   | 56   | 55   | 50   |
|           | Cooling: Low Speed   | 62  | 58  | 57  | 51   | 48   | 47   | 41   |
|           | Cooling: High Speed  | 66  | 63  | 61  | 58   | 56   | 54   | 49   |
|           | Heating: Low Speed   | 67  | 60  | 60  | 52   | 49   | 48   | 43   |
|           | Heating: High Speed  | 68  | 64  | 62  | 58   | 56   | 55   | 50   |
| 036       | Fan Only: Low Speed  | 59  | 55  | 49  | 43   | 41   | 39   | 33   |
|           | Fan Only: High Speed | 72  | 69  | 59  | 56   | 55   | 54   | 48   |
|           | Cooling: Low Speed   | 60  | 55  | 50  | 47   | 42   | 40   | 35   |
|           | Cooling: High Speed  | 72  | 69  | 58  | 56   | 55   | 54   | 48   |
|           | Heating: Low Speed   | 64  | 56  | 52  | 47   | 43   | 41   | 40   |
|           | Heating: High Speed  | 72  | 68  | 58  | 55   | 54   | 53   | 47   |
| 042       | Fan Only: Low Speed  | 61  | 57  | 51  | 44   | 43   | 41   | 35   |
|           | Fan Only: High Speed | 72  | 70  | 60  | 57   | 55   | 55   | 50   |
|           | Cooling: Low Speed   | 65  | 59  | 54  | 49   | 45   | 43   | 39   |
|           | Cooling: High Speed  | 72  | 69  | 59  | 57   | 55   | 55   | 49   |
|           | Heating: Low Speed   | 67  | 59  | 54  | 48   | 45   | 44   | 42   |
|           | Heating: High Speed  | 72  | 69  | 59  | 56   | 55   | 54   | 49   |
| 048       | Fan Only: Low Speed  | 63  | 60  | 53  | 46   | 45   | 44   | 38   |
|           | Fan Only: High Speed | 72  | 70  | 61  | 57   | 56   | 56   | 51   |
|           | Cooling: Low Speed   | 71  | 63  | 58  | 52   | 48   | 46   | 44   |
|           | Cooling: High Speed  | 72  | 69  | 61  | 58   | 56   | 56   | 51   |
|           | Heating: Low Speed   | 70  | 62  | 57  | 50   | 47   | 46   | 45   |
|           | Heating: High Speed  | 72  | 69  | 61  | 56   | 55   | 55   | 51   |
| 060       | Fan Only: Low Speed  | 70  | 73  | 62  | 61   | 56   | 56   | 49   |
|           | Fan Only: High Speed | 74  | 72  | 64  | 63   | 61   | 61   | 55   |
|           | Cooling: Low Speed   | 69  | 72  | 63  | 60   | 55   | 55   | 48   |
|           | Cooling: High Speed  | 73  | 70  | 64  | 63   | 61   | 61   | 54   |
|           | Heating: Low Speed   | 72  | 71  | 63  | 61   | 56   | 56   | 50   |
|           | Heating: High Speed  | 73  | 70  | 64  | 62   | 60   | 60   | 54   |
| 070       | Fan Only: Low Speed  | 71  | 74  | 63  | 61   | 56   | 57   | 50   |
|           | Fan Only: High Speed | 74  | 72  | 65  | 63   | 61   | 62   | 55   |
|           | Cooling: Low Speed   | 75  | 77  | 67  | 63   | 58   | 59   | 53   |
|           | Cooling: High Speed  | 75  | 72  | 67  | 66   | 63   | 63   | 57   |
|           | Heating: Low Speed   | 76  | 75  | 67  | 64   | 59   | 60   | 54   |
|           | Heating: High Speed  | 75  | 72  | 67  | 64   | 62   | 63   | 57   |

NOTE: All performance is Sound Power Level in dB referenced to 1 picroWatt.

# Performance data (cont)



## SOUND DATA — CASE RADIATED WITH MUTE CONSTRUCTION

| 50PS UNIT | MODE                 | FREE AIR INLET COMBINED WITH CASING (CABINET)<br>RADIATED OCTAVE BAND FREQUENCY, Hz |     |     |      |      |      |      |
|-----------|----------------------|---|-----|-----|------|------|------|------|
|           |                      | 125   | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| 018       | Fan Only: Low Speed  | 52  | 51  | 49  | 40   | 37   | 36   | 30   |
|           | Fan Only: High Speed | 59  | 56  | 53  | 46   | 44   | 42   | 37   |
|           | Cooling: Low Speed   | 59  | 50  | 51  | 46   | 42   | 37   | 29   |
|           | Cooling: High Speed  | 60  | 56  | 57  | 51   | 49   | 45   | 38   |
|           | Heating: Low Speed   | 66  | 52  | 50  | 46   | 45   | 38   | 31   |
|           | Heating: High Speed  | 65  | 56  | 56  | 51   | 49   | 45   | 41   |
| 024       | Fan Only: Low Speed  | 57  | 55  | 53  | 44   | 41   | 40   | 35   |
|           | Fan Only: High Speed | 62  | 59  | 56  | 50   | 48   | 46   | 42   |
|           | Cooling: Low Speed   | 60  | 53  | 53  | 47   | 44   | 40   | 33   |
|           | Cooling: High Speed  | 62  | 58  | 58  | 53   | 51   | 48   | 41   |
|           | Heating: Low Speed   | 66  | 54  | 54  | 48   | 44   | 41   | 34   |
|           | Heating: High Speed  | 66  | 59  | 58  | 53   | 51   | 48   | 45   |
| 030       | Fan Only: Low Speed  | 61  | 58  | 56  | 49   | 46   | 45   | 41   |
|           | Fan Only: High Speed | 65  | 62  | 59  | 55   | 51   | 50   | 47   |
|           | Cooling: Low Speed   | 61  | 55  | 56  | 49   | 45   | 43   | 36   |
|           | Cooling: High Speed  | 64  | 61  | 60  | 55   | 52   | 51   | 45   |
|           | Heating: Low Speed   | 66  | 57  | 58  | 50   | 46   | 44   | 38   |
|           | Heating: High Speed  | 66  | 61  | 60  | 55   | 52   | 51   | 49   |
| 036       | Fan Only: Low Speed  | 58  | 55  | 47  | 41   | 38   | 36   | 33   |
|           | Fan Only: High Speed | 71  | 67  | 56  | 52   | 50   | 49   | 45   |
|           | Cooling: Low Speed   | 59  | 52  | 48  | 44   | 39   | 36   | 30   |
|           | Cooling: High Speed  | 70  | 66  | 57  | 53   | 51   | 50   | 43   |
|           | Heating: Low Speed   | 63  | 53  | 50  | 44   | 40   | 37   | 35   |
|           | Heating: High Speed  | 70  | 66  | 56  | 52   | 51   | 50   | 46   |
| 042       | Fan Only: Low Speed  | 60  | 57  | 49  | 43   | 40   | 39   | 35   |
|           | Fan Only: High Speed | 71  | 68  | 57  | 53   | 51   | 50   | 47   |
|           | Cooling: Low Speed   | 64  | 56  | 52  | 47   | 42   | 39   | 34   |
|           | Cooling: High Speed  | 70  | 66  | 58  | 54   | 52   | 51   | 45   |
|           | Heating: Low Speed   | 66  | 56  | 53  | 46   | 42   | 40   | 37   |
|           | Heating: High Speed  | 70  | 66  | 58  | 53   | 51   | 50   | 47   |
| 048       | Fan Only: Low Speed  | 62  | 60  | 51  | 44   | 42   | 41   | 38   |
|           | Fan Only: High Speed | 71  | 68  | 59  | 53   | 52   | 51   | 48   |
|           | Cooling: Low Speed   | 69  | 60  | 57  | 49   | 45   | 42   | 39   |
|           | Cooling: High Speed  | 70  | 66  | 59  | 55   | 53   | 53   | 47   |
|           | Heating: Low Speed   | 69  | 59  | 56  | 48   | 44   | 42   | 40   |
|           | Heating: High Speed  | 70  | 67  | 59  | 53   | 52   | 51   | 49   |
| 060       | Fan Only: Low Speed  | 69  | 73  | 60  | 59   | 53   | 53   | 49   |
|           | Fan Only: High Speed | 73  | 70  | 62  | 59   | 57   | 56   | 52   |
|           | Cooling: Low Speed   | 68  | 69  | 61  | 57   | 52   | 51   | 43   |
|           | Cooling: High Speed  | 71  | 67  | 63  | 60   | 57   | 57   | 50   |
|           | Heating: Low Speed   | 70  | 68  | 62  | 58   | 53   | 52   | 45   |
|           | Heating: High Speed  | 71  | 68  | 62  | 59   | 57   | 57   | 52   |
| 070       | Fan Only: Low Speed  | 70  | 75  | 61  | 60   | 53   | 54   | 50   |
|           | Fan Only: High Speed | 73  | 70  | 62  | 59   | 57   | 57   | 52   |
|           | Cooling: Low Speed   | 73  | 74  | 66  | 61   | 55   | 55   | 48   |
|           | Cooling: High Speed  | 73  | 69  | 66  | 63   | 60   | 60   | 53   |
|           | Heating: Low Speed   | 74  | 72  | 65  | 61   | 56   | 56   | 49   |
|           | Heating: High Speed  | 73  | 70  | 65  | 61   | 59   | 59   | 55   |

NOTE: All performance is Sound Power Level in dB referenced to 1 picoWatt.

# Electrical data



## 50PSH, PSV, PSD STANDARD PSC MOTOR AND HWR ELECTRICAL DATA

| 50PS<br>UNIT<br>SIZE | RATED<br>VOLTAGE<br>V-Ph-Hz | VOLTAGE<br>MIN/MAX | COMPRESSOR |       |     | FAN<br>MOTOR<br>FLA | TOTAL<br>UNIT<br>FLA | MIN<br>CIRCUIT<br>AMP | MAX<br>FUSE/<br>HACR | UNITS WITH PSC MOTOR AND HWR |                      |                       |                       |
|----------------------|-----------------------------|--------------------|------------|-------|-----|---------------------|----------------------|-----------------------|----------------------|------------------------------|----------------------|-----------------------|-----------------------|
|                      |                             |                    | RLA        | LRA   | Qty |                     |                      |                       |                      | REHEAT<br>PUMP<br>FLA        | TOTAL<br>UNIT<br>FLA | MIN<br>CIRCUIT<br>AMP | MAX<br>FUSE /<br>HACR |
| 006                  | 208/230-1-60                | 197/254            | 3.1        | 17.7  | 1   | 0.4                 | 3.5                  | 4.3                   | 15                   | 0.43                         | 3.9                  | 4.7                   | 15                    |
|                      | 265-1-60                    | 239/292            | 2.6        | 13.5  | 1   | 0.4                 | 3.0                  | 3.6                   | 15                   | 0.70                         | 3.7                  | 4.3                   | 15                    |
| 009                  | 208/230-1-60                | 197/254            | 3.9        | 21.0  | 1   | 0.4                 | 4.3                  | 5.3                   | 15                   | 0.43                         | 4.8                  | 5.7                   | 15                    |
|                      | 265-1-60                    | 239/292            | 3.7        | 22.0  | 1   | 0.4                 | 4.1                  | 5.0                   | 15                   | 0.70                         | 10.0                 | 12.1                  | 20                    |
| 012                  | 208/230-1-60                | 197/254            | 5.0        | 25.0  | 1   | 0.7                 | 5.7                  | 7.0                   | 15                   | 0.43                         | 6.1                  | 7.4                   | 15                    |
|                      | 265-1-60                    | 239/292            | 4.5        | 22.0  | 1   | 0.7                 | 5.2                  | 6.4                   | 15                   | N/A                          | N/A                  | N/A                   | N/A                   |
| 018                  | 208/230-1-60                | 197/254            | 9.0        | 48.0  | 1   | 1.0                 | 10.0                 | 12.3                  | 20                   | 0.80                         | 10.8                 | 13.1                  | 20                    |
|                      | 265-1-60                    | 239/292            | 8.4        | 40.0  | 1   | 0.9                 | 9.3                  | 11.4                  | 15                   | 0.70                         | 10.0                 | 12.1                  | 20                    |
| 024                  | 208/230-1-60                | 197/254            | 13.5       | 58.3  | 1   | 1.6                 | 15.1                 | 18.5                  | 30                   | 0.80                         | 15.9                 | 19.3                  | 30                    |
|                      | 265-1-60                    | 239/292            | 9.0        | 54.0  | 1   | 1.1                 | 10.1                 | 12.4                  | 20                   | 0.70                         | 10.8                 | 13.1                  | 20                    |
|                      | 208/230-3-60                | 197/254            | 7.1        | 55.4  | 1   | 1.6                 | 8.7                  | 10.5                  | 15                   | 0.80                         | 9.5                  | 11.3                  | 15                    |
|                      | 460-3-60*                   | 414/506            | 3.5        | 28.0  | 1   | 0.9                 | 4.4                  | 5.3                   | 15                   | 0.70                         | 6.0                  | 9.5                   | 15                    |
| 030                  | 208/230-1-60                | 197/254            | 12.8       | 64.0  | 1   | 1.8                 | 14.6                 | 17.8                  | 30                   | 0.80                         | 15.4                 | 18.6                  | 30                    |
|                      | 265-1-60                    | 239/292            | 10.9       | 60.0  | 1   | 1.4                 | 12.3                 | 15.0                  | 25                   | 0.70                         | 13.0                 | 15.7                  | 25                    |
|                      | 208/230-3-60                | 197/254            | 8.3        | 58.0  | 1   | 1.8                 | 10.1                 | 12.2                  | 20                   | 0.80                         | 10.9                 | 13.0                  | 20                    |
|                      | 460-3-60*                   | 414/506            | 5.1        | 28.0  | 1   | 1.0                 | 6.1                  | 7.4                   | 15                   | 0.70                         | 6.8                  | 8.1                   | 15                    |
| 036                  | 208/230-1-60                | 197/254            | 16.0       | 77.0  | 1   | 1.8                 | 17.8                 | 21.8                  | 35                   | 0.80                         | 18.6                 | 22.6                  | 35                    |
|                      | 208/230-3-60                | 197/254            | 10.0       | 71.0  | 1   | 1.8                 | 11.8                 | 14.3                  | 20                   | 0.80                         | 12.6                 | 15.1                  | 25                    |
|                      | 460-3-60*                   | 414/506            | 4.7        | 38.0  | 1   | 1.0                 | 5.7                  | 6.9                   | 15                   | 0.70                         | 6.4                  | 7.6                   | 15                    |
| 042                  | 208/230-1-60                | 197/254            | 16.7       | 79.0  | 1   | 2.2                 | 18.9                 | 23.1                  | 35                   | 0.80                         | 19.7                 | 23.9                  | 40                    |
|                      | 265-1-60                    | 239/292            | 13.5       | 72.0  | 1   | 1.7                 | 15.2                 | 18.6                  | 30                   | 0.70                         | 15.9                 | 19.3                  | 30                    |
|                      | 208/230-3-60                | 197/254            | 10.4       | 73.0  | 1   | 2.2                 | 12.6                 | 15.2                  | 25                   | 0.80                         | 13.4                 | 16.0                  | 25                    |
|                      | 460-3-60*                   | 414/506            | 5.8        | 38.0  | 1   | 1.0                 | 6.8                  | 8.3                   | 15                   | 0.70                         | 7.5                  | 9.0                   | 15                    |
|                      | 575-3-60                    | 518/633            | 3.8        | 36.5  | 1   | 0.8                 | 4.6                  | 5.6                   | 15                   | N/A                          | N/A                  | N/A                   | N/A                   |
| 048                  | 208/230-1-60                | 197/254            | 21.8       | 117.0 | 1   | 2.7                 | 24.5                 | 30.0                  | 50                   | 1.10                         | 25.6                 | 31.0                  | 50                    |
|                      | 265-1-60                    | 239/292            | 16.3       | 98.0  | 1   | 2.9                 | 19.2                 | 23.3                  | 35                   | 1.30                         | 20.5                 | 24.6                  | 40                    |
|                      | 208/230-3-60                | 197/254            | 13.7       | 83.1  | 1   | 2.7                 | 16.4                 | 19.8                  | 30                   | 1.10                         | 17.5                 | 20.9                  | 30                    |
|                      | 460-3-60*                   | 414/506            | 6.2        | 41.0  | 1   | 1.7                 | 7.9                  | 9.5                   | 15                   | 1.30                         | 9.0                  | 10.6                  | 15                    |
|                      | 575-3-60                    | 518/633            | 4.8        | 33.1  | 1   | 1.4                 | 6.2                  | 7.4                   | 15                   | N/A                          | N/A                  | N/A                   | N/A                   |
| 060                  | 208/230-1-60                | 197/254            | 26.4       | 134.0 | 1   | 3.8                 | 30.2                 | 36.8                  | 60                   | 1.10                         | 31.3                 | 37.9                  | 60                    |
|                      | 208/230-3-60                | 197/254            | 16.0       | 110.0 | 1   | 3.8                 | 19.8                 | 23.8                  | 35                   | 1.10                         | 20.9                 | 24.9                  | 40                    |
|                      | 460-3-60*                   | 414/506            | 7.8        | 52.0  | 1   | 1.3                 | 9.1                  | 11.1                  | 15                   | 1.30                         | 10.4                 | 12.4                  | 20                    |
|                      | 575-3-60                    | 518/633            | 5.7        | 38.9  | 1   | 2.2                 | 7.9                  | 9.3                   | 15                   | N/A                          | N/A                  | N/A                   | N/A                   |
| 070                  | 208/230-1-60                | 197/254            | 30.8       | 178.0 | 1   | 4.0                 | 34.8                 | 42.5                  | 70                   | 1.10                         | 35.9                 | 43.6                  | 70                    |
|                      | 208/230-3-60                | 197/254            | 19.6       | 138.0 | 1   | 4.0                 | 23.6                 | 28.5                  | 45                   | 1.10                         | 24.7                 | 29.6                  | 45                    |
|                      | 460-3-60*                   | 414/506            | 8.2        | 66.1  | 1   | 2.6                 | 10.8                 | 12.9                  | 20                   | 1.30                         | 12.1                 | 14.2                  | 20                    |
|                      | 575-3-60                    | 518/633            | 6.6        | 55.3  | 1   | 1.5                 | 8.1                  | 9.8                   | 15                   | N/A                          | N/A                  | N/A                   | N/A                   |

### LEGEND

**FLA** — Full Load Amps  
**HACR** — Heating, Air Conditioning and Refrigeration  
**HWR** — Hot Water Reheat  
**LRA** — Locked Rotor Amps  
**RLA** — Rated Load Amps

\*NEUTRAL CONNECTION REQUIRED. All 460 vac units with HWR require a 4-wire power supply with neutral. Reheat pump is rated 265 vac and is wired between one hot leg and neutral.

# Electrical data (cont)



## 50PSH, PSV, PSD HIGH-STATIC PSC MOTOR AND HWR ELECTRICAL DATA

| 50PS<br>UNIT<br>SIZE | RATED<br>VOLTAGE<br>V-Ph-Hz | VOLTAGE<br>MIN/MAX | COMPRESSOR |       |     | FAN<br>MOTOR<br>FLA | TOTAL<br>UNIT<br>FLA | MIN<br>CIRCUIT<br>AMP | MAX<br>FUSE/<br>HACR | UNITS WITH HIGH-STATIC PSC MOTOR AND<br>HWR |                      |                       |                       |
|----------------------|-----------------------------|--------------------|------------|-------|-----|---------------------|----------------------|-----------------------|----------------------|---|----------------------|-----------------------|-----------------------|
|                      |                             |                    | RLA        | LRA   | Qty |                     |                      |                       |                      | REHEAT<br>PUMP<br>FLA                       | TOTAL<br>UNIT<br>FLA | MIN<br>CIRCUIT<br>AMP | MAX<br>FUSE /<br>HACR |
| 018                  | 208/230-1-60                | 197/254            | 9.0        | 48.0  | 1   | 1.10                | 10.1                 | 12.4                  | 20                   | 0.80  | 10.9                 | 13.2                  | 20                    |
|                      | 265-1-60                    | 239/292            | 8.4        | 40.0  | 1   | 0.90                | 9.3                  | 11.4                  | 15                   | 0.70  | 10.0                 | 12.1                  | 20                    |
| 024                  | 208/230-1-60                | 197/254            | 13.5       | 58.3  | 1   | 1.80                | 15.3                 | 18.7                  | 30                   | 0.80  | 16.1                 | 19.5                  | 30                    |
|                      | 265-1-60                    | 239/292            | 9.0        | 54.0  | 1   | 1.40                | 10.4                 | 12.7                  | 20                   | 0.70  | 11.1                 | 13.4                  | 20                    |
|                      | 208/230-3-60                | 197/254            | 7.1        | 55.4  | 1   | 1.80                | 8.9                  | 10.7                  | 15                   | 0.80  | 9.7                  | 11.5                  | 15                    |
|                      | 460-3-60*                   | 414/506            | 3.5        | 28.0  | 1   | 1.00                | 4.5                  | 5.4                   | 15                   | 0.70  | 5.2                  | 6.1                   | 15                    |
| 030                  | 208/230-1-60                | 197/254            | 12.8       | 64.0  | 1   | 2.20                | 15.0                 | 18.2                  | 30                   | 0.80  | 15.8                 | 19.0                  | 30                    |
|                      | 265-1-60                    | 239/292            | 10.9       | 60.0  | 1   | 1.70                | 12.6                 | 15.3                  | 25                   | 0.70  | 13.3                 | 16.0                  | 25                    |
|                      | 208/230-3-60                | 197/254            | 8.3        | 58.0  | 1   | 2.20                | 10.5                 | 12.6                  | 20                   | 0.80  | 11.3                 | 13.4                  | 20                    |
|                      | 460-3-60*                   | 414/506            | 5.1        | 28.0  | 1   | 1.00                | 6.1                  | 6.9                   | 15                   | 0.70  | 6.8                  | 8.1                   | 15                    |
| 036                  | 208/230-1-60                | 197/254            | 16.0       | 77.0  | 1   | 2.20                | 18.2                 | 22.2                  | 35                   | 0.80  | 19.0                 | 23.0                  | 35                    |
|                      | 208/230-3-60                | 197/254            | 10.0       | 71.0  | 1   | 2.20                | 12.2                 | 14.7                  | 25                   | 0.80  | 13.0                 | 15.5                  | 25                    |
|                      | 460-3-60*                   | 414/506            | 4.7        | 38.0  | 1   | 1.00                | 5.7                  | 6.9                   | 15                   | 0.70  | 6.4                  | 7.6                   | 15                    |
| 042                  | 208/230-1-60                | 197/254            | 16.7       | 79.0  | 1   | 2.70                | 19.4                 | 23.6                  | 35                   | 0.80  | 20.2                 | 24.4                  | 40                    |
|                      | 265-1-60                    | 239/292            | 13.5       | 72.0  | 1   | 2.90                | 16.4                 | 19.8                  | 30                   | 0.70  | 17.1                 | 20.5                  | 30                    |
|                      | 208/230-3-60                | 197/254            | 10.4       | 73.0  | 1   | 2.70                | 13.1                 | 15.7                  | 25                   | 0.80  | 13.9                 | 16.5                  | 25                    |
|                      | 460-3-60*                   | 414/506            | 5.8        | 38.0  | 1   | 1.70                | 7.5                  | 9.0                   | 15                   | 0.70  | 8.2                  | 9.7                   | 15                    |
|                      | 575-3-60                    | 518/633            | 3.8        | 36.5  | 1   | 1.40                | 5.2                  | 6.2                   | 15                   | N/A   | N/A                  | N/A                   | N/A                   |
| 048                  | 208/230-1-60                | 197/254            | 21.8       | 117.0 | 1   | 2.60                | 24.4                 | 29.9                  | 50                   | 1.10  | 25.0                 | 31.0                  | 50                    |
|                      | 208/230-3-60                | 197/254            | 13.7       | 83.1  | 1   | 2.60                | 16.3                 | 19.7                  | 30                   | 1.10  | 17.4                 | 20.8                  | 30                    |
|                      | 460-3-60*                   | 414/506            | 6.2        | 41.0  | 1   | 1.80                | 8.0                  | 9.6                   | 15                   | 1.30  | 9.3                  | 10.9                  | 15                    |
|                      | 575-3-60                    | 518/633            | 4.8        | 33.0  | 1   | 1.40                | 6.2                  | 7.4                   | 15                   | N/A   | N/A                  | N/A                   | N/A                   |
| 060                  | 208/230-1-60                | 197/254            | 26.4       | 134.0 | 1   | 4.00                | 30.4                 | 37.0                  | 60                   | 1.10  | 31.5                 | 38.1                  | 60                    |
|                      | 208/230-3-60                | 197/254            | 16.0       | 110.0 | 1   | 4.00                | 20.0                 | 24.0                  | 35                   | 1.10  | 21.1                 | 25.1                  | 40                    |
|                      | 460-3-60*                   | 414/506            | 7.8        | 52.0  | 1   | 2.60                | 10.4                 | 12.4                  | 15                   | 1.30  | 11.7                 | 13.7                  | 20                    |
|                      | 575-3-60                    | 518/633            | 5.7        | 38.9  | 1   | 1.50                | 7.2                  | 8.6                   | 15                   | N/A   | N/A                  | N/A                   | N/A                   |

### LEGEND

**FLA** — Full Load Amps  
**HACR** — Heating, Air Conditioning and Refrigeration  
**HWR** — Hot Water Reheat  
**LRA** — Locked Rotor Amps  
**RLA** — Rated Load Amps

\*NEUTRAL CONNECTION REQUIRED. All 460 vac units with HWR require a 4-wire power supply with neutral. Reheat pump is rated 265 vac and is wired between one hot leg and neutral.

## 50PSH, PSV, PSD ECM MOTOR AND HWR ELECTRICAL DATA

| 50PS<br>UNIT<br>SIZE | RATED<br>VOLTAGE<br>V-Ph-Hz | VOLTAGE<br>MIN/MAX | COMPRESSOR |       |     | FAN<br>MOTOR<br>FLA | TOTAL<br>UNIT<br>FLA | MIN<br>CIRCUIT<br>AMP | MAX<br>FUSE/<br>HACR | UNITS WITH ECM MOTOR AND HWR |                      |                       |                       |
|----------------------|-----------------------------|--------------------|------------|-------|-----|---------------------|----------------------|-----------------------|----------------------|------------------------------|----------------------|-----------------------|-----------------------|
|                      |                             |                    | RLA        | LRA   | Qty |                     |                      |                       |                      | REHEAT<br>PUMP<br>FLA        | TOTAL<br>UNIT<br>FLA | MIN<br>CIRCUIT<br>AMP | MAX<br>FUSE /<br>HACR |
| 018                  | 208/230-1-60                | 197/254            | 9.0        | 48.0  | 1   | 3.9                 | 12.9                 | 15.2                  | 20                   | 0.8                          | 13.7                 | 16.0                  | 20                    |
|                      | 265-1-60                    | 239/292            | 8.4        | 40.0  | 1   | 3.2                 | 11.6                 | 13.7                  | 20                   | 0.7                          | 12.3                 | 14.4                  | 20                    |
| 024                  | 208/230-1-60                | 197/254            | 13.5       | 58.3  | 1   | 3.9                 | 17.4                 | 20.8                  | 30                   | 0.8                          | 18.2                 | 21.6                  | 35                    |
|                      | 265-1-60                    | 239/292            | 9.0        | 54.0  | 1   | 3.2                 | 12.2                 | 14.5                  | 20                   | 0.7                          | 12.9                 | 15.2                  | 20                    |
|                      | 208/230-3-60                | 197/254            | 7.1        | 55.4  | 1   | 3.9                 | 11.0                 | 12.8                  | 15                   | 0.8                          | 11.8                 | 13.6                  | 20                    |
|                      | 460-3-60*                   | 414/506            | 3.5        | 28.0  | 1   | 3.2                 | 6.7                  | 7.6                   | 15                   | 0.7                          | 7.4                  | 8.3                   | 15                    |
| 030                  | 208/230-1-60                | 197/254            | 12.8       | 64.0  | 1   | 3.9                 | 16.7                 | 19.9                  | 30                   | 0.8                          | 17.5                 | 20.7                  | 30                    |
|                      | 265-1-60                    | 239/292            | 10.9       | 60.0  | 1   | 3.2                 | 14.1                 | 16.8                  | 25                   | 0.7                          | 14.8                 | 17.5                  | 25                    |
|                      | 208/230-3-60                | 197/254            | 8.3        | 58.0  | 1   | 3.9                 | 12.2                 | 14.3                  | 20                   | 0.8                          | 13.0                 | 15.1                  | 20                    |
|                      | 460-3-60*                   | 414/506            | 5.1        | 28.0  | 1   | 3.2                 | 8.3                  | 9.6                   | 15                   | 0.7                          | 9.0                  | 10.3                  | 15                    |
| 036                  | 208/230-1-60                | 197/254            | 16.0       | 77.0  | 1   | 3.9                 | 19.9                 | 23.9                  | 35                   | 0.8                          | 20.7                 | 24.7                  | 40                    |
|                      | 208/230-3-60                | 197/254            | 10.0       | 71.0  | 1   | 3.9                 | 13.9                 | 16.4                  | 25                   | 0.8                          | 14.7                 | 17.2                  | 25                    |
|                      | 460-3-60*                   | 414/506            | 4.7        | 38.0  | 1   | 3.2                 | 7.9                  | 9.1                   | 15                   | 0.7                          | 8.6                  | 9.8                   | 15                    |
| 042                  | 208/230-1-60                | 197/254            | 16.7       | 79.0  | 1   | 3.9                 | 20.6                 | 24.8                  | 40                   | 0.8                          | 21.4                 | 25.6                  | 40                    |
|                      | 265-1-60                    | 239/292            | 13.5       | 72.0  | 1   | 3.2                 | 16.7                 | 20.1                  | 30                   | 0.7                          | 17.4                 | 20.8                  | 30                    |
|                      | 208/230-3-60                | 197/254            | 10.4       | 73.0  | 1   | 3.9                 | 14.3                 | 16.9                  | 25                   | 0.8                          | 15.1                 | 17.7                  | 25                    |
|                      | 460-3-60*                   | 414/506            | 5.8        | 38.0  | 1   | 3.2                 | 9.0                  | 10.5                  | 15                   | 0.7                          | 9.7                  | 11.2                  | 15                    |
| 048                  | 208/230-1-60                | 197/254            | 21.8       | 117.0 | 1   | 6.9                 | 28.7                 | 34.2                  | 50                   | 1.1                          | 29.8                 | 35.3                  | 50                    |
|                      | 265-1-60                    | 239/292            | 16.3       | 98.0  | 1   | 6.0                 | 22.3                 | 26.4                  | 40                   | 1.3                          | 23.6                 | 27.7                  | 40                    |
|                      | 208/230-3-60                | 197/254            | 13.7       | 83.1  | 1   | 6.9                 | 20.6                 | 24.0                  | 35                   | 1.1                          | 21.7                 | 25.1                  | 35                    |
|                      | 460-3-60*                   | 414/506            | 6.2        | 41.0  | 1   | 6.0                 | 12.2                 | 13.8                  | 20                   | 1.3                          | 13.5                 | 15.1                  | 20                    |
| 060                  | 208/230-1-60                | 197/254            | 26.4       | 134.0 | 1   | 6.9                 | 33.3                 | 39.9                  | 60                   | 1.1                          | 34.4                 | 41.0                  | 60                    |
|                      | 208/230-3-60                | 197/254            | 16.0       | 110.0 | 1   | 6.9                 | 22.9                 | 26.9                  | 40                   | 1.1                          | 24.0                 | 28.0                  | 40                    |
|                      | 460-3-60*                   | 414/506            | 7.8        | 52.0  | 1   | 6.0                 | 13.8                 | 15.8                  | 20                   | 1.3                          | 15.1                 | 17.1                  | 20                    |
| 070                  | 208/230-1-60                | 197/254            | 30.8       | 178.0 | 1   | 6.0                 | 37.7                 | 45.4                  | 70                   | 1.1                          | 37.9                 | 45.6                  | 70                    |
|                      | 208/230-3-60                | 197/254            | 19.6       | 138.0 | 1   | 6.9                 | 26.5                 | 31.4                  | 50                   | 1.1                          | 27.6                 | 32.5                  | 50                    |
|                      | 460-3-60*                   | 414/506            | 8.2        | 66.1  | 1   | 6.0                 | 14.2                 | 16.3                  | 20                   | 1.3                          | 15.5                 | 17.6                  | 25                    |

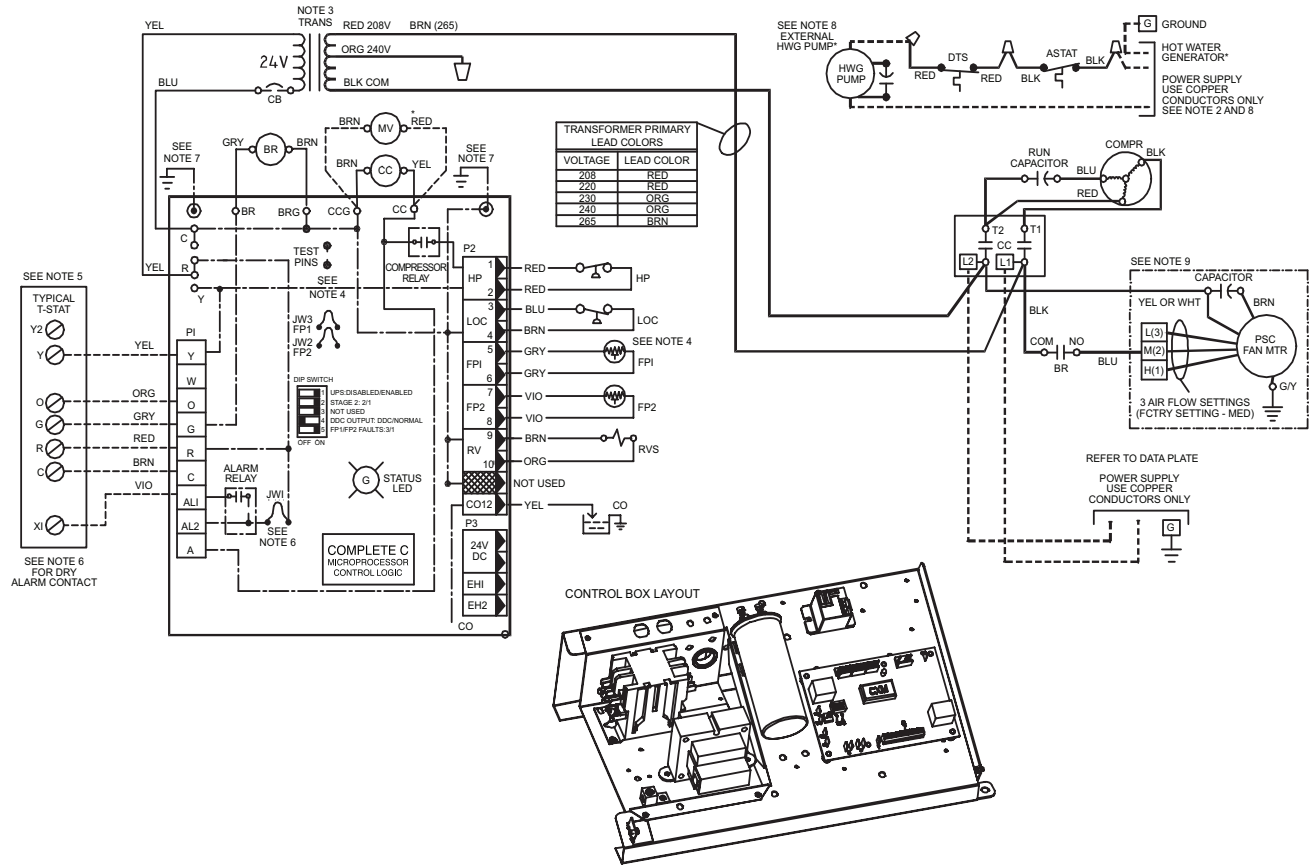
### LEGEND

**FLA** — Full Load Amps  
**HACR** — Heating, Air Conditioning and Refrigeration  
**HWR** — Hot Water Reheat  
**LRA** — Locked Rotor Amps  
**RLA** — Rated Load Amps

\*NEUTRAL CONNECTION REQUIRED. All 460 vac units with HWR require a 4-wire power supply with neutral. Reheat pump is rated 265 vac and is wired between one hot leg and neutral.

# Typical control wiring schematics

## UNITS WITH COMPLETE C CONTROLLER, SINGLE-PHASE



- AL** — Alarm Relay Contacts  
**ASTAT** — Aquastat  
**BR** — Blower Relay  
**CB** — Circuit Breaker  
**CC** — Compressor Contactor  
**CO** — Condensate Overflow Sensor  
**COMPR** — Compressor  
**DTS** — Discharge Temp Switch  
**FP1** — Water Coil Freeze Protection Sensor  
**FP2** — Air Coil Freeze Protection Sensor  
**HP** — High-Pressure Switch  
**HWG** — Hot Water Generator  
**JW** — Jumper Wire  
**LOC** — Loss of Charge Pressure Switch  
**MV** — Motorized Valve  
**NEC** — National Electrical Code  
**PSC** — Permanent Split Capacitor  
**P1** — Field Wiring Terminal Block  
**RVS** — Reversing Valve Solenoid

- TRANS** — Transformer  
**UPS** — Unit Performance Sentinel  
 — Factory Low Voltage Wiring  
 — Factory Line Voltage Wiring  
 - - - Field Low Voltage Wiring  
 - - - Field Line Voltage Wiring  
 - - - Printed Circuit Trace  
 - - - Optional Wiring  
 ○ — Relay/Contactor Coil  
 ⊕ — Thermistor  
 ⊞ — Condensate Pan  
 ⊞ — Circuit Breaker

- ⊞ — Solenoid Coil  
 ⊞ — Relay Contacts - N.C.  
 ⊞ — Relay Contacts - N.O.  
 ⊞ — Capacitor  
 ⊞ — Temperature Switch  
 ⊞ — Low Pressure Switch  
 ⊞ — High Pressure Switch  
 ⊞ — Wire Nut  
 ⊞ — Splice Cap  
 ⊞ — LED

\*Optional.

### NOTES:

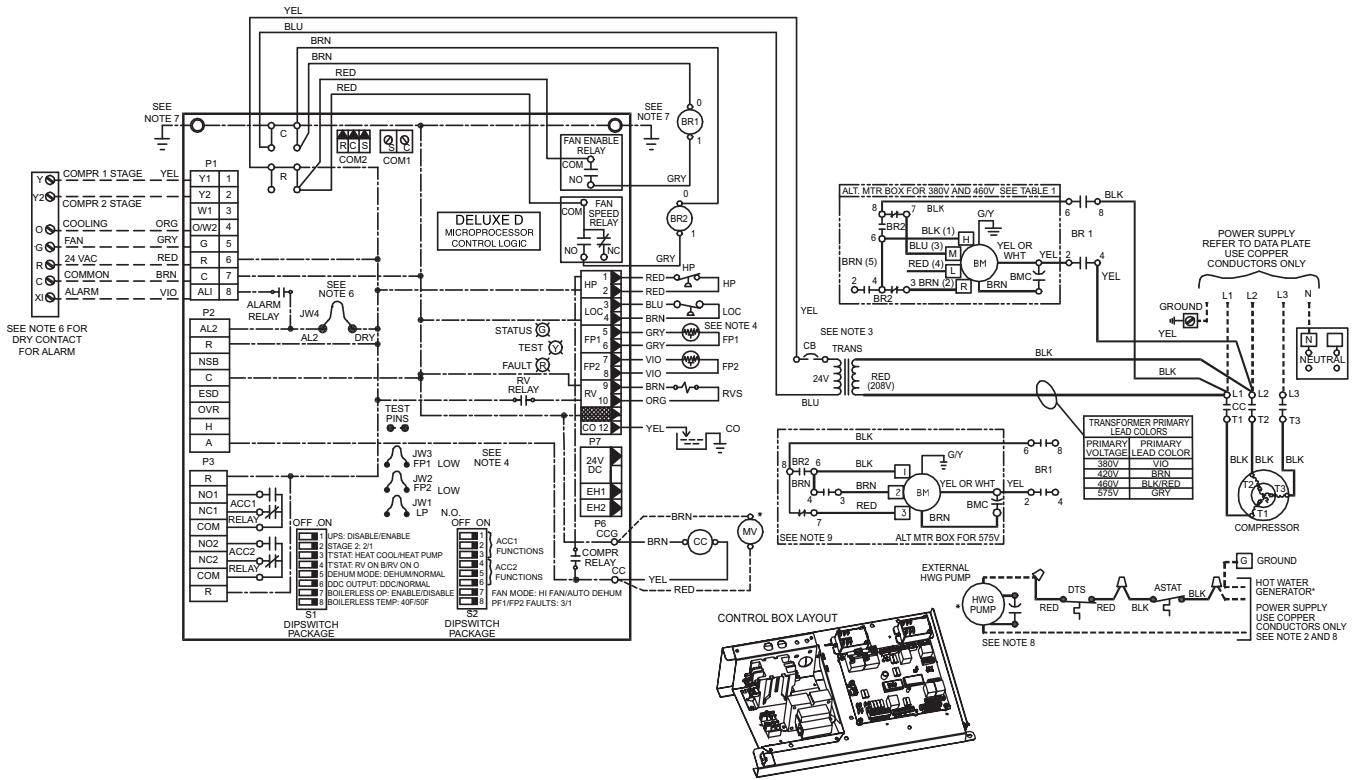
- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- 208/230 v transformer will be connected for 208 v operation. For 230 v operation, disconnect RED lead at L1 and attach ORANGE lead to L1. Insulate open end of RED lead. Transformer is energy limiting or may have circuit breaker.
- FP1 thermistor provides freeze protection for water. When using anti-freeze solutions, cut JW3 jumper.
- Check installation wiring information for specific thermostat hookup. Refer to thermostat installation instructions for wiring to the unit. Thermostat wiring must be "Class 1" and voltage rating equal to or greater than unit supply voltage.
- 24-v alarm signal shown. For dry alarm contact, cut JW1 jumper and dry contact will be available between AL1 and AL2.
- Transformer secondary ground via Complete C board standoffs and screws to control box. (Ground available from top two standoffs as shown.)
- Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltage up to 277 v.
- Fan motors factory wired for medium speed. For high and low speed remove BLU wire from fan motor speed tap 'M' and connect to 'H' for high or 'L' for low.

### COMPLETE C CONTROLLER FAULT CODES

| DESCRIPTION OF OPERATION                | LED             | ALARM RELAY                        |
|---|-----------------|------------------------------------|
| Normal Mode                             | ON              | Open                               |
| Normal Mode with UPS Warning            | ON              | Cycle (Closed 5 Sec. Open 25 Sec.) |
| Complete C is Non-Functional            | OFF             | Open                               |
| Fault Retry                             | Slow Flash      | Open                               |
| Lockout                                 | Fast Flash      | Closed                             |
| Over/Under Voltage Shutdown             | Slow Flash      | Open (Closed After 15 Min.)        |
| Test Mode-No Fault in Memory            | Flashing Code 1 | Cycling Code 1                     |
| Test Mode-HP Fault in Memory            | Flashing Code 2 | Cycling Code 2                     |
| Test Mode-LP Fault in Memory            | Flashing Code 3 | Cycling Code 3                     |
| Test Mode-FP1 Fault in Memory           | Flashing Code 4 | Cycling Code 4                     |
| Test Mode-FP2 Fault in Memory           | Flashing Code 5 | Cycling Code 5                     |
| Test Mode-CO Fault in Memory            | Flashing Code 6 | Cycling Code 6                     |
| Test Mode-Over/Under Shutdown in Memory | Flashing Code 7 | Cycling Code 7                     |
| Test Mode-UPS in Memory                 | Flashing Code 8 | Cycling Code 8                     |
| Swapped FP1/FP2 Lockout                 | Flashing Code 9 | Cycling Code 9                     |

# Typical control wiring schematics (cont)

## UNITS WITH DELUXE D CONTROLLER, THREE-PHASE (460/575 V)



### NOTES:

- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- Transformer is wired to 460 v (BLK/RED) lead for 460/60/3 units. 575 v (GRY) lead for 575/60/3. Transformer is energy limiting or may have circuit breaker.
- FP1 thermistor provides freeze protection for water. When using antifreeze solutions, cut JW3 jumper.
- Check installation wiring information for specific thermostat hookup. Refer to thermostat installation instructions for wiring to the unit. Thermostat wiring must be "Class 1" and voltage rating equal to or greater than unit supply voltage.
- 24-v alarm signal shown. For dry alarm contact, cut JW4 jumper and dry contact will be available between AL1 and AL2.
- Transformer secondary ground via Deluxe D board standoffs and screws to control box. (Ground available from top two standoffs as shown.)
- Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltage up to 277 v.
- Blower motor is factory wired for high and low speeds. No other combination is available.
- The 460-v units using an ECM (electronically commutated motor) fan motor, modulating HWR, and/or an internal secondary pump will require a neutral wire from the supply side in order to feed the accessory with 265-v.

| TABLE 1 WIRE NUMBER |                 |                 |                 |                 |                  |
|---------------------|-----------------|-----------------|-----------------|-----------------|------------------|
| Blower Speeds       | 1               | 2               | 3               | 4               | 5                |
| Factory             | BM(H) to BR2(6) | BM(R) to BR2(3) | BM(M) to BR2(7) | Not Used        | BR2(6) to BR2(4) |
| HI + MED            | BM(H) to BR2(6) | BM(R) to BR2(3) | Not Used        | BM(L) to BR2(7) | BR2(6) to BR2(4) |
| HI + LOW            | BM(H) to BR2(6) | BM(R) to BR2(3) | Not Used        | BM(L) to BR2(7) | BR2(6) to BR2(4) |
| MED + LOW           | BM(H) to BR2(3) | BM(R) to BR2(3) | BM(M) to BR2(6) | BM(L) to BR2(7) | BR2(2) to BR2(4) |

### DELUXE D CONTROLLER FAULT CODES

| OPERATION                  | STATUS LED (GREEN)      | TEST LED (YELLOW) | FAULT LED (RED) | ALARM RELAY    |
|----------------------------|-------------------------|-------------------|-----------------|----------------|
| Normal Mode                | ON                      | OFF               | Note 2          | Open           |
| Deluxe D is Non-Functional | OFF                     | OFF               | OFF             | Open           |
| Test Mode                  | —                       | ON                | Note 2          | Cycle (Note 3) |
| Night Setback              | Flashing Code 2         | —                 | Note 2          | —              |
| Emergency Shut Down        | Flashing Code 3         | —                 | Note 2          | —              |
| Invalid Thermostat Inputs  | Flashing Code 4         | —                 | Note 2          | —              |
| No Fault in Memory         | ON                      | OFF               | Flashing Code 1 | Open           |
| HP Fault/(Lockout) Note 1  | Slow Flash/(Fast Flash) | OFF               | Flashing Code 2 | Open/(Closed)  |
| LP Fault/(Lockout) Note 1  | Slow Flash/(Fast Flash) | OFF               | Flashing Code 3 | Open/(Closed)  |
| FP1 Fault/(Lockout) Note 1 | Slow Flash/(Fast Flash) | OFF               | Flashing Code 4 | Open/(Closed)  |
| FP2 Fault/(Lockout) Note 1 | Slow Flash/(Fast Flash) | OFF               | Flashing Code 5 | Open/(Closed)  |
| CC Fault/(Lockout) Note 1  | Slow Flash/(Fast Flash) | OFF               | Flashing Code 6 | Open/(Closed)  |
| Over-Under Voltage         | Slow Flash              | OFF               | Flashing Code 7 | Open (Note 4)  |
| Normal Mode with UPS       | ON                      | OFF               | Flashing Code 8 | Cycle (Note 5) |
| Swapped FP1/FP2 Lockout    | Fast Flash              | OFF               | Flashing Code 9 | Closed         |

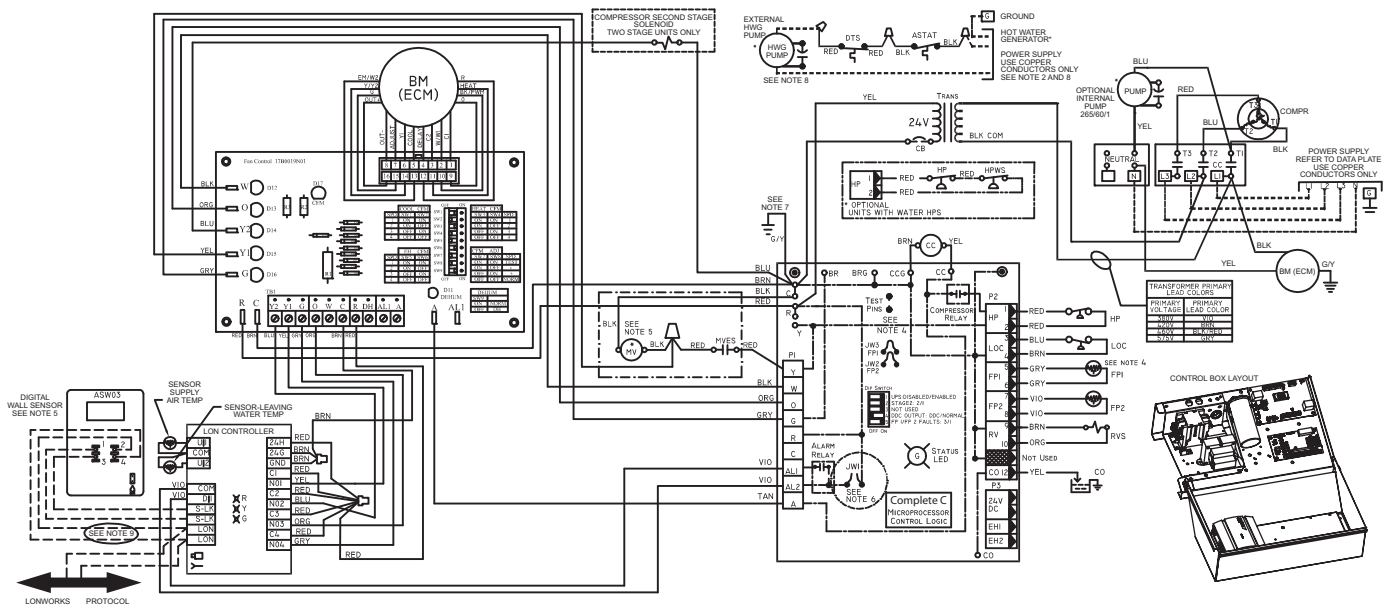
### NOTES:

- Status LED (GREEN) Slow Flash - Controller In - Fault Retry Mode. Fast Flash - Controller in Lockout Mode. Slow Flash = 1 Flash per every 2 seconds. Fast Flash = 2 Flashes per every 1 second.
- Fault LED (RED) flashes a code representing last fault in memory. If no fault in memory code 1 is flashed.
- Cycles appropriate code, by cycling alarm relay in the same sequence as fault LED.
- Alarm relay closes after 15 minutes.
- Alarm relay cycles. Closed for 5 seconds and open for 25 seconds.



# Typical control wiring schematics (cont)

## UNITS WITH ECM, COMPLETE C AND LON CONTROLLER (460 V)



### LEGEND

|                   |  |
|-------------------|--|
| <b>AL</b>         | — Alarm Relay Contacts                 |
| <b>ASTAT</b>      | — Aquastat                             |
| <b>BM</b>         | — Blower Motor                         |
| <b>BMC</b>        | — Blower Motor Capacitor               |
| <b>BR</b>         | — Blower Relay                         |
| <b>CB</b>         | — Circuit Breaker                      |
| <b>CC</b>         | — Compressor Contactor                 |
| <b>CO</b>         | — Sensor, Condensate Overflow          |
| <b>DTS</b>        | — Discharge Temperature Switch         |
| <b>ECM</b>        | — Electronically Commutated Motor      |
| <b>FP1</b>        | — Sensor, Water Coil Freeze Protection |
| <b>FP2</b>        | — Sensor, Air Coil Freeze Protection   |
| <b>HP</b>         | — High-Pressure Switch                 |
| <b>HPWS</b>       | — High-Pressure Water Switch           |
| <b>HWG</b>        | — Hot Water Generator                  |
| <b>JW1</b>        | — Clippable Field Selection Jumper     |
| <b>LOC</b>        | — Loss of Charge Pressure Switch       |
| <b>LON</b>        | — Local Operating Network              |
| <b>MV</b>         | — Motorized Valve                      |
| <b>MVES</b>       | — Motorized Valve End Switch           |
| *Optional Wiring. |  |

|              |                               |
|--------------|-------------------------------|
| <b>NEC</b>   | — National Electrical Code    |
| <b>P1</b>    | — Field Wiring Terminal Block |
| <b>RVS</b>   | — Reversing Valve Solenoid    |
| <b>TRANS</b> | — Transformer                 |
| ---          | Field Line Voltage Wiring     |
| ---          | Field Low Voltage Wiring      |
| - . -        | Printed Circuit Trace         |
| - . .        | Optional Wiring               |
| ○            | Relay/Contactor Coil          |
| □            | Condensate Pan                |
| ⊞            | Solenoid Coil                 |
| ⊞            | Temperature Switch            |
| ⊞            | Thermistor                    |
| ⊞            | Ground                        |

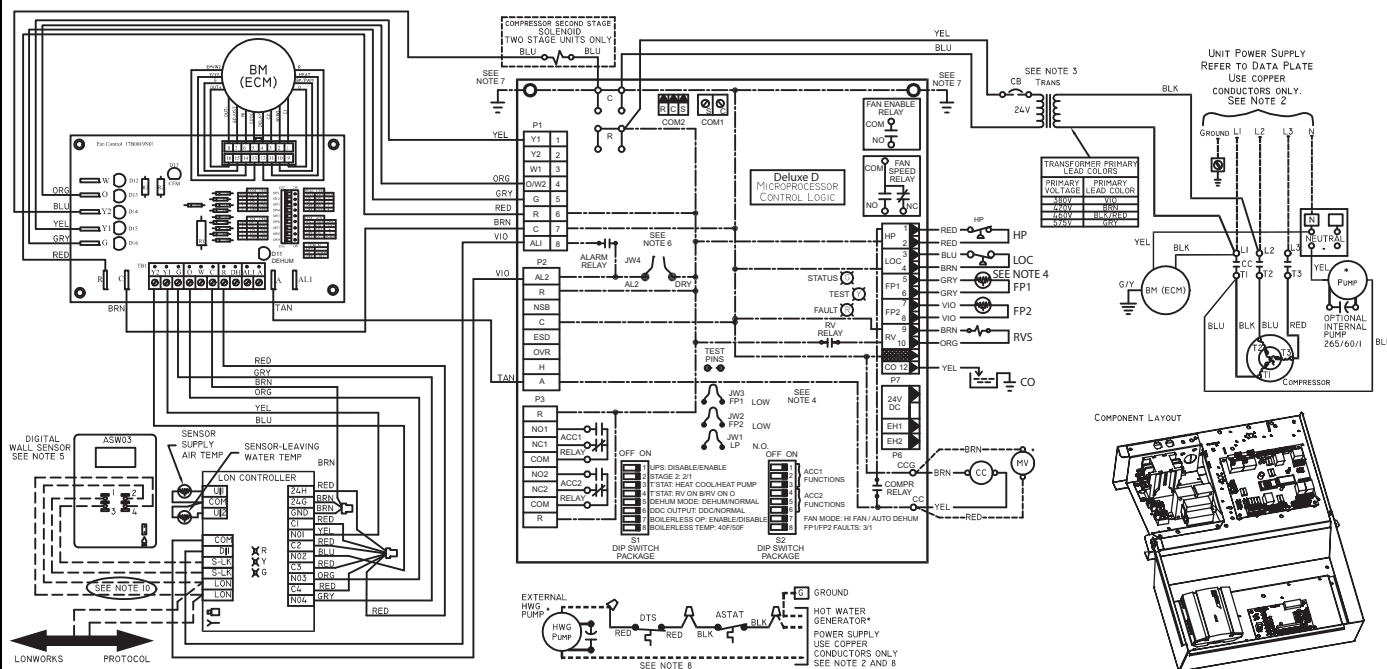
|   |                       |
|---|-----------------------|
| □ | Wire Nut              |
| ⊞ | Relay Contacts - N.C. |
| ⊞ | Relay Contacts - N.O. |
| ⊞ | Low Pressure Switch   |
| ⊞ | High Pressure Switch  |
| ⊞ | Splice Cap            |
| ⊞ | Circuit Breaker       |

### NOTES:

- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- Transformer is wired to 460 v (BLK/RED) lead for 460/3/60 units. Transformer is energy limiting or may have circuit breaker.
- FP1 thermistor provides freeze protection for water. When using antifreeze solutions, cut JW3 jumper.
- Typical thermostat wiring shown. Refer to thermostat installation instructions for wiring to the unit. Thermostat wiring must be Class 1 and voltage rating equal to or greater than unit supply voltage.
- Factory cut JW1 jumper. Dry contact will be available between AL1 and AL2.
- Transformer secondary ground via Complete C board standoffs and screws to control box. (Ground available from top two standoffs as shown.)

- Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltages up to 277-v.
- Optional LON wires. Only connect if LON connection is desired at the wall sensor.
- Fan motors are factory wired for medium speed. For high or low speed, remove BLU wire from fan motor speed tap "M" and connect to "H" for high speed or "L" for low speed.
- For low speed, remove BLK wire from BR "6" and replace with RED. Connect BLK and BRN wires together.
- For blower motors with leads. For medium or low speed, disconnect BLK wire from BR "6". Connect BLK and ORG/PUR wire together. Connect RED for low or BLU for medium to BR "6".
- The 460-v units using an ECM (electronically commutated motor) fan motor, modulating HWR, and/or an internal secondary pump will require a neutral wire from the supply side in order to feed the accessory with 265-v.

## UNITS WITH ECM, DELUXE D AND LON CONTROLLER (460 V)



### LEGEND

**AL** — Alarm Relay Contacts  
**ALSTAT** — Aquastat  
**BM** — Blower Motor  
**BMC** — Blower Motor Capacitor  
**BR** — Blower Relay  
**CB** — Circuit Breaker  
**CC** — Compressor Contactor  
**CO** — Sensor, Condensate Overflow  
**DTS** — Discharge Temperature Switch  
**ECM** — Electronically Commutated Motor  
**FP1** — Sensor, Water Coil Freeze Protection  
**FP2** — Sensor, Air Coil Freeze Protection  
**HP** — High-Pressure Switch  
**HPWS** — High-Pressure Water Switch  
**HWG** — Hot Water Generator  
**JW1** — Clippable Field Selection Jumper  
**LOC** — Loss of Charge Pressure Switch  
**LON** — Local Operating Network  
**MV** — Motorized Valve  
**NEC** — National Electrical Code  
 \*Optional Wiring.

**P1** — Field Wiring Terminal Block  
**RVS** — Reversing Valve Solenoid  
**TRANS** — Transformer  
 --- Field Line Voltage Wiring  
 --- Field Low Voltage Wiring  
 --- Printed Circuit Trace  
 --- Optional Wiring  
 ○ Relay/Contactor Coil  
 Condensate Pan  
 Solenoid Coil  
 Temperature Switch  
 Thermistor  
 Ground

□ Wire Nut  
 ○ Relay Contacts - N.C.  
 ○ Relay Contacts - N.O.  
 ○ Low Pressure Switch  
 ○ High Pressure Switch  
 □ Splice Cap  
 ○ Circuit Breaker

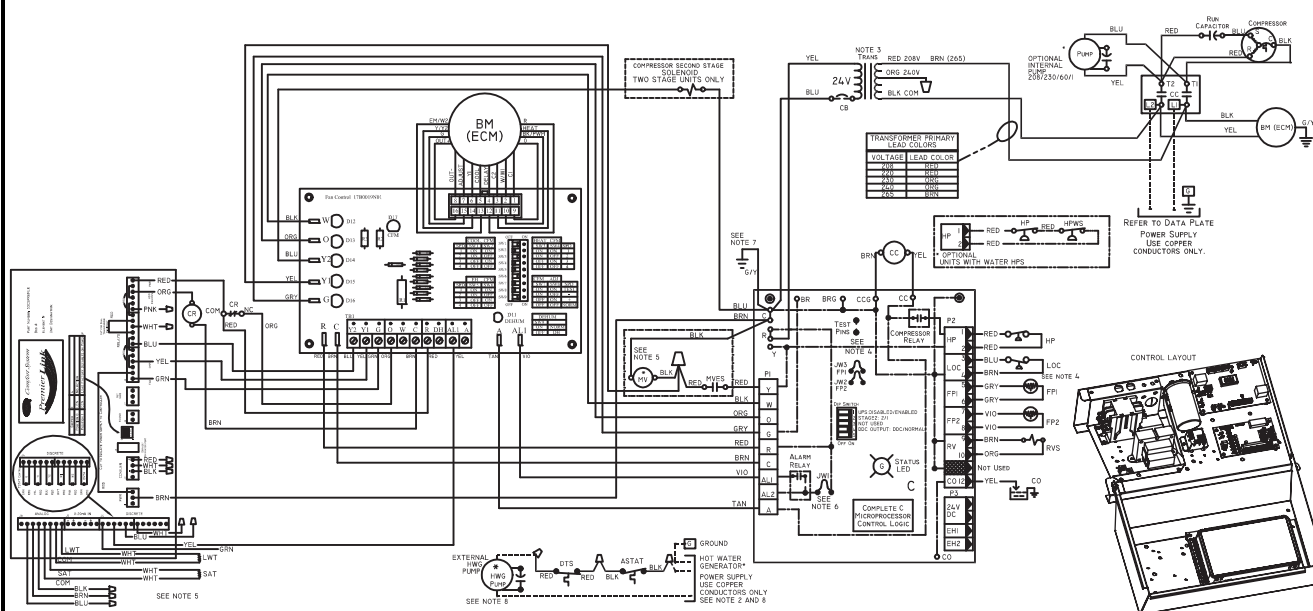
### NOTES:

- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- Transformer is wired to 460 v (BLK/RED) lead for 460/3/60 units. Transformer is energy limiting or may have circuit breaker.
- FP1 thermistor provides freeze protection for water. When using antifreeze solutions, cut JW3 jumper.
- Typical thermostat wiring shown. Refer to thermostat installation instructions for wiring to the unit. Thermostat wiring must be Class 1 and voltage rating equal to or greater than unit supply voltage.
- Factory cut JW1 jumper. Dry contact will be available between AL1 and AL2.
- Transformer secondary ground via Deluxe D board standoffs and screws to control box. (Ground available from top two standoffs as shown.)

- Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltages up to 277-v.
- Place jumpers on 2 and 3, integrated control motor (ICM) board, when dehumidification mode is used.
- Optional LON wires. Only connect if LON connection is desired at the wall sensor.
- Blower motor is factory wired for medium and high speeds. For any other combination of speeds, at the motor attach the BLK wire to the higher of the two desired speed taps and the BLU wire to the lower of the two desired speed taps.
- Blower motor is factory wired for high and low speeds. No other combination is available.
- The 460-v units using an ECM (electronically commutated motor) fan motor, modulating HWR, and/or an internal secondary pump will require a neutral wire from the supply side in order to feed the accessory with 265-v.

# Typical control wiring schematics (cont)

## UNITS WITH COMPLETE C AND PREMIERLINK™ CONTROLLER, SINGLE-PHASE (208/230 V)



### LEGEND

**AL** — Alarm Relay Contacts  
**ASTAT** — Aquastat  
**BM** — Blower Motor  
**BR** — Blower Relay  
**CB** — Circuit Breaker  
**CC** — Compressor Contactor  
**CO** — Sensor, Condensate Overflow  
**CR** — Cooling Relay  
**DTs** — Discharge Temp Switch  
**FP1** — Sensor, Water Coil Freeze Protection  
**FP2** — Sensor, Air Coil Freeze Protection  
**HP** — High Pressure Switch  
**HPWS** — High Pressure Water Switch  
**HWG** — Hot Water Generator  
**JW** — Jumper Wire  
**LOC** — Loss of Charge Pressure Switch  
**LWT** — Leaving Water Temperature  
**MV** — Motorized Valve  
**MVES** — Motorized Valve End Switch  
**P1** — Field Wiring Terminal Block  
**RVS** — Reversing Valve Solenoid  
**SAT** — Saturated Air Temperature  
**TRANS** — Transformer  
**UPS** — Unit Performance Sentinel

Field Line Voltage Wiring  
 Field Low Voltage Wiring  
 Printed Circuit Trace  
 Optional Wiring  
 Relay/Contactor Coil  
 Condensate Pan  
 Solenoid Coil  
 Temperature Switch  
 Thermistor  
 Ground

Wire Nut  
 Relay Contacts - N.C.  
 Relay Contacts - N.O.  
 Low Pressure Switch  
 High Pressure Switch  
 Splice Cap  
 Circuit Breaker  
 Capacitor  
 LED

\*Optional Wiring.

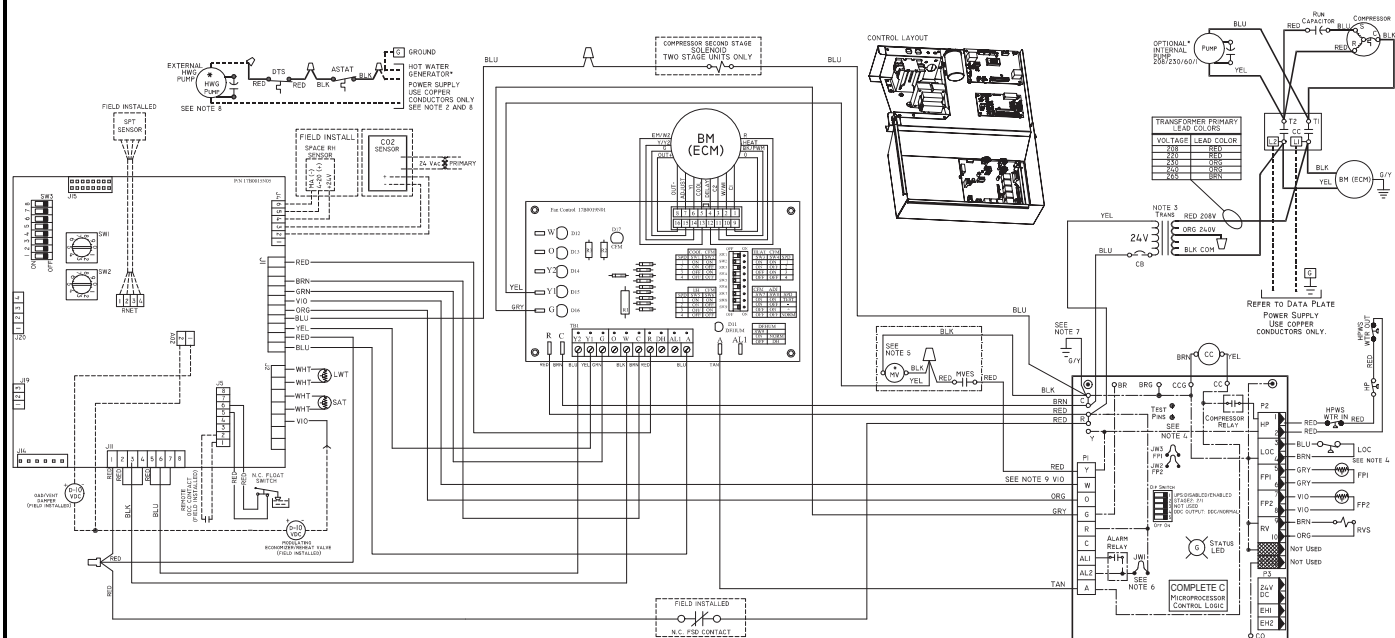
### NOTES:

- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- 208-240 60 Hz units are wired for 208v operation. Transformer is energy limiting or may have circuit breaker.
- FP1 thermistor provides low temperature protection for water. When using antifreeze solutions, cut JW3 jumper.
- Refer to multiple protocol controller (MPC), LON, or TSTAT Installation, Application, and Operation Manual for control wiring to the wire from PremierLink controller to "Y" Complete C when motorized valve is not used. Thermostat wiring must be "Class 1" and voltage rating equal to or greater than unit supply voltage.
- 24v alarm signal shown. For dry contact, cut JW1 jumper and dry contact will be available between AL1 and AL2.
- Transformer secondary ground via green wire with yellow stripe from "C" terminal to control box.
- Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltages up to 277v.

### COMPLETE C CONTROLLER FAULT CODES

| DESCRIPTION OF OPERATION                | LED             | ALARM RELAY                        |
|---|-----------------|------------------------------------|
| Normal Mode                             | ON              | Open                               |
| Normal Mode with UPS Warning            | ON              | Cycle (Closed 5 Sec. Open 25 Sec.) |
| Complete C is Non-Functional            | OFF             | Open                               |
| Fault Retry                             | Slow Flash      | Open                               |
| Lockout                                 | Fast Flash      | Closed                             |
| Over/Under Voltage Shutdown             | Slow Flash      | Open (Closed After 15 Min.)        |
| Test Mode-No Fault in Memory            | Flashing Code 1 | Cycling Code 1                     |
| Test Mode-HP Fault in Memory            | Flashing Code 2 | Cycling Code 2                     |
| Test Mode-LP Fault in Memory            | Flashing Code 3 | Cycling Code 3                     |
| Test Mode-FP1 Fault in Memory           | Flashing Code 4 | Cycling Code 4                     |
| Test Mode-FP2 Fault in Memory           | Flashing Code 5 | Cycling Code 5                     |
| Test Mode-CO Fault in Memory            | Flashing Code 6 | Cycling Code 6                     |
| Test Mode-Over/Under Shutdown in Memory | Flashing Code 7 | Cycling Code 7                     |
| Test Mode-UPS in Memory                 | Flashing Code 8 | Cycling Code 8                     |
| Swapped FP1/FP2 Lockout                 | Flashing Code 9 | Cycling Code 9                     |

## UNITS WITH ECM, COMPLETE C AND WSHP OPEN CONTROLS, SINGLE PHASE (208/230 V, 265 V)



### LEGEND

|              |  |
|--------------|--|
| <b>AL</b>    | — Alarm Relay Contacts                 |
| <b>ASTAT</b> | — Aquastat                             |
| <b>BM</b>    | — Blower Motor                         |
| <b>BMC</b>   | — Blower Motor Capacitor               |
| <b>BR</b>    | — Blower Relay                         |
| <b>CB</b>    | — Circuit Breaker                      |
| <b>CC</b>    | — Compressor Contactor                 |
| <b>CO</b>    | — Condensate Overflow Sensor           |
| <b>CR</b>    | — Cooling Relay                        |
| <b>DTS</b>   | — Discharge Temp Switch                |
| <b>FP1</b>   | — Sensor, Water Coil Freeze Protection |
| <b>FP2</b>   | — Sensor, Air Coil Freeze Protection   |
| <b>HP</b>    | — High Pressure Switch                 |
| <b>HPWS</b>  | — High Pressure Water Switch           |
| <b>HWG</b>   | — Hot Water Generator                  |
| <b>HWR</b>   | — Hot Water Reheat                     |
| <b>JW</b>    | — Jumper Wire                          |
| <b>LAT</b>   | — Leaving Air Temperature              |
| <b>LOC</b>   | — Loss of Charge Pressure Switch       |
| <b>LWT</b>   | — Leaving Water Temperature            |
| <b>MV</b>    | — Motorized Valve                      |
| <b>MVES</b>  | — Motorized Valve End Switch           |
| <b>P1</b>    | — Field Wiring Terminal Block          |
| <b>RVS</b>   | — Reversing Valve Solenoid             |
| <b>SAT</b>   | — Saturated Air Temperature            |
| <b>TRANS</b> | — Transformer                          |

\*Optional Wiring.

|  |                             |
|--|-----------------------------|
|  | Factory Line Voltage Wiring |
|  | Factory Low Voltage Wiring  |
|  | Field Line Voltage Wiring   |
|  | Field Low Voltage Wiring    |
|  | Printed Circuit Trace       |
|  | Optional Wiring             |
|  | Relay/Contactor Coil        |
|  | Condensate Pan              |
|  | Solenoid Coil               |
|  | Temperature Switch          |
|  | Thermistor                  |
|  | Ground                      |

|  |                       |
|--|-----------------------|
|  | Wire Nut              |
|  | Relay Contacts - N.C. |
|  | Relay Contacts - N.O. |
|  | Low Pressure Switch   |
|  | High Pressure Switch  |
|  | Splice Cap            |
|  | Circuit Breaker       |
|  | Capacitor             |
|  | LED                   |

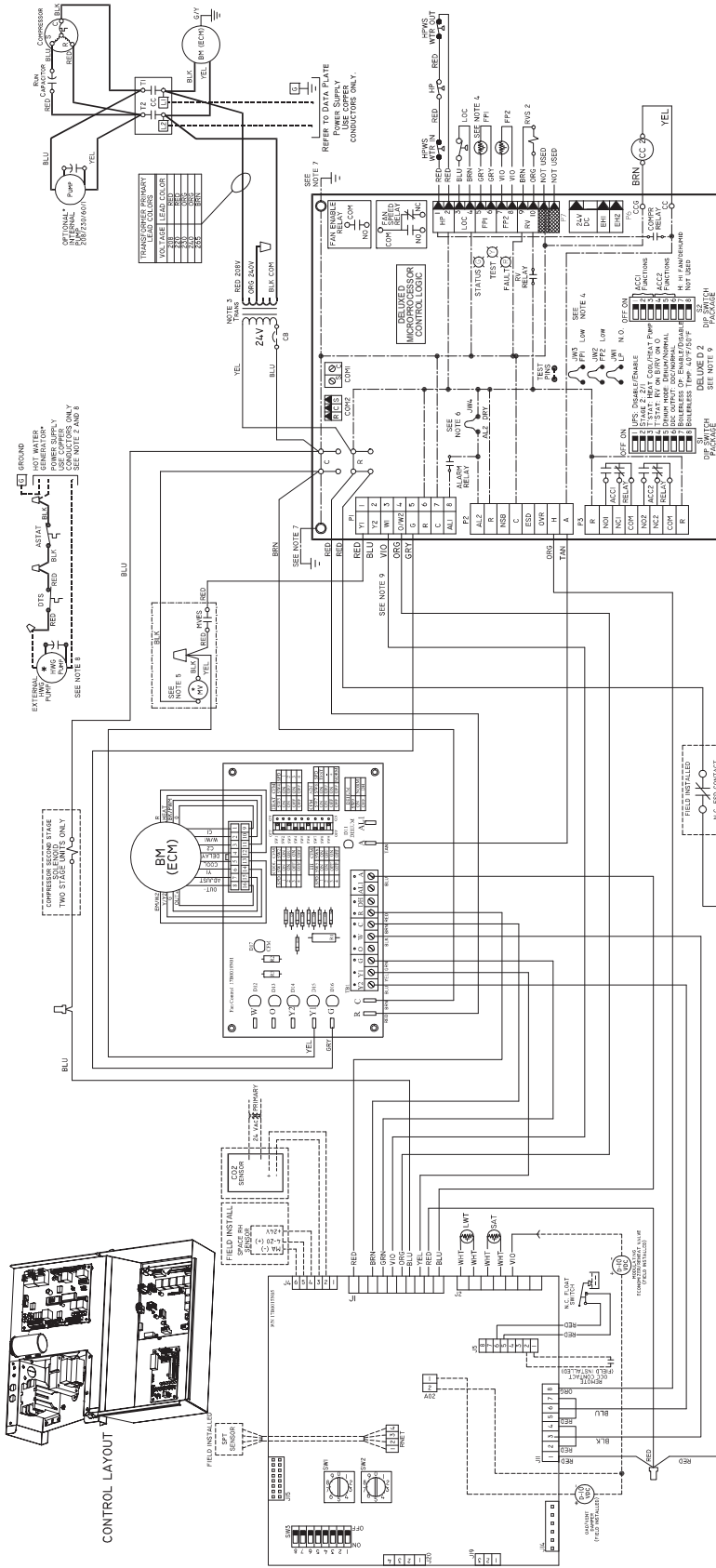
### NOTES:

1. Compressor and blower motor thermally protected internally.
2. All wiring to the unit must comply with NEC and local codes.
3. 208-240 60 Hz units are wired for 208v operation. Transformer is energy limiting or may have circuit breaker.
4. FP1 thermistor provides low temperature protection for water. When using antifreeze solutions, cut JW3 jumper.
5. Refer to multiple protocol controller (MPC), LON, or TSTAT Installation, Application, and Operation Manual for control wiring to the wire from PremierLink controller to "Y" Complete C when motorized valve is not used. Thermostat wiring must be "Class 1" and voltage rating equal to or greater than unit supply voltage.

6. 24v alarm signal shown. For dry contact, cut JW1 jumper and dry contact will be available between AL1 and AL2.
7. Transformer secondary ground via green wire with yellow stripe from "C" terminal to control box.
8. Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltages up to 277v.
9. For field-installed 2-position hot water reheat (HWR) coils, disconnect wire from W1 and connect to field-supplied hot water valve.

# Typical control wiring schematics (cont)

## UNITS WITH ECM, DELUXE D AND WSHF OPEN CONTROLS, THREE-PHASE (208/230 V, 265/60/1)

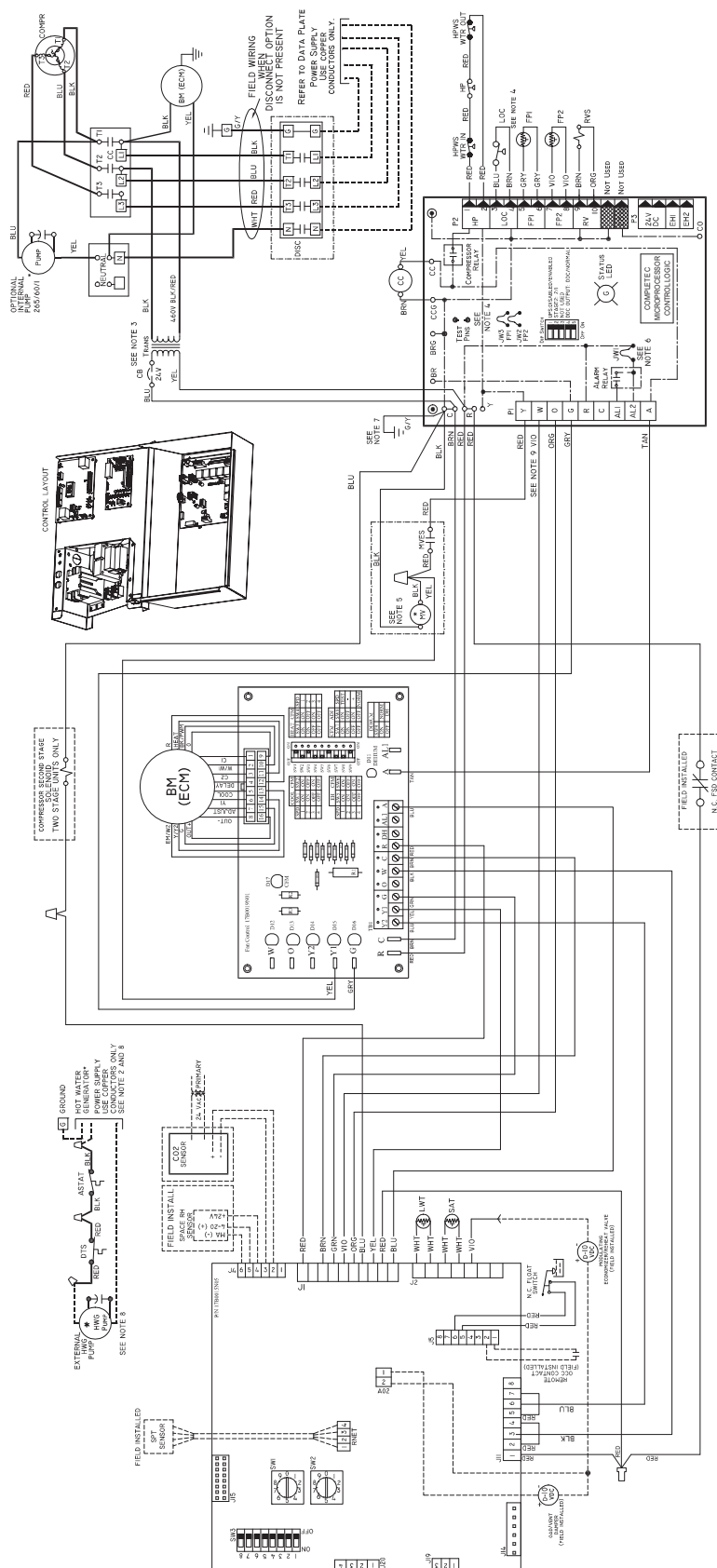


- 1" and voltage rating equal to or greater than unit supply voltage.
- 24-v alarm signal shown. For dry alarm contact, cut JW1 jumper and dry contact will be available between AL1 and AL2.
- Transformer secondary ground via green wire with yellow stripe from "C" terminal to control box.
- Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltage up to 277 v.
- For field-installed 2-position hot water reheat (HWR) coils, disconnect wire from W1 and connect to field-supplied hot water valve.

### LEGEND

- AL** Alarm Relay Contacts  
**ASTAT** Aquastat  
**BM** Blower Motor  
**BMC** Blower Motor Capacitor  
**BR** Blower Relay  
**CAP** Compressor Capacitor  
**CB** Circuit Breaker  
**CC** Compressor Contactor  
**CO** Condensate Overflow Sensor  
**CR** Cooling Relay  
**DTS** Discharge Temp Switch  
**FP1** Sensor, Water Coil Freeze Protection  
**FP2** Sensor, Air Coil Freeze Protection  
**HP** High-Pressure Switch  
**HPWS** High-Pressure Water Switch  
**JW** Jumper Wire  
**LAT** Leaving Air Temperature  
**LOC** Loss of Charge Pressure Switch  
**LWT** Leaving Water Temperature  
**MV** Motorized Valve  
**MVES** Motorized Valve End Switch
- NEC** National Electrical Code  
**P1** Field Wiring Terminal Block  
**RVS** Reversing Valve Solenoid  
**SAT** Saturated Air Temperature Sensor  
**SPT** Space Temperature Sensor  
**TRANS** Transformer
- Field Line Voltage Wiring**  
**Field Low Voltage Wiring**  
**Printed Circuit Trace**  
**Relay/Contactor Coil**  
**Condensate Pan**  
**Solenoid Coil**  
**Thermistor**  
**Ground**  
**Wire Nut**

# UNITS WITH ECM, COMPLETE C AND WSHWP OPEN CONTROLS, THREE-PHASE (460 V)



## LEGEND

|        |                                      |
|--------|--------------------------------------|
| AL     | Alarm Relay Contacts                 |
| ALSTAT | Aquastat                             |
| BM     | Blower Motor                         |
| BMC    | Blower Motor Capacitor               |
| BR     | Blower Relay                         |
| CAP    | Compressor Capacitor                 |
| CB     | Circuit Breaker                      |
| CC     | Compressor Contactor                 |
| CO     | Condensate Overflow Sensor           |
| CR     | Cooling Relay                        |
| DTS    | Discharge Temp Switch                |
| FP1    | Sensor, Water Coil Freeze Protection |
| FP2    | Sensor, Air Coil Freeze Protection   |
| HP     | High-Pressure Switch                 |
| HPWS   | High-Pressure Water Switch           |
| HWG    | Hot Water Generator                  |
| JW     | Jumper Wire                          |
| LAT    | Leaving Air Temperature              |
| LOC    | Loss of Charge Pressure Switch       |
| LWT    | Leaving Water Temperature            |
| MV     | Motorized Valve                      |
| MVES   | Motorized Valve End Switch           |
| NEC    | National Electrical Code             |

|     |                             |
|-----|-----------------------------|
| P1  | Field Wiring Terminal Block |
| RVS | Reversing Valve Solenoid    |
| SAT | Saturated Air Temperature   |
| SPT | Space Temperature Sensor    |
| --- | Field Line Voltage Wiring   |
| --- | Field Low Voltage Wiring    |
| --- | Printed Circuit Trace       |
| --- | Optional Wiring             |
| ○   | Relay/Contactor Coil        |
| □   | Condensate Pan              |
| ○   | Solenoid Coil               |
| ○   | Temperature Switch          |
| ○   | Thermistor                  |
| □   | Ground                      |
| □   | Wire Nut                    |

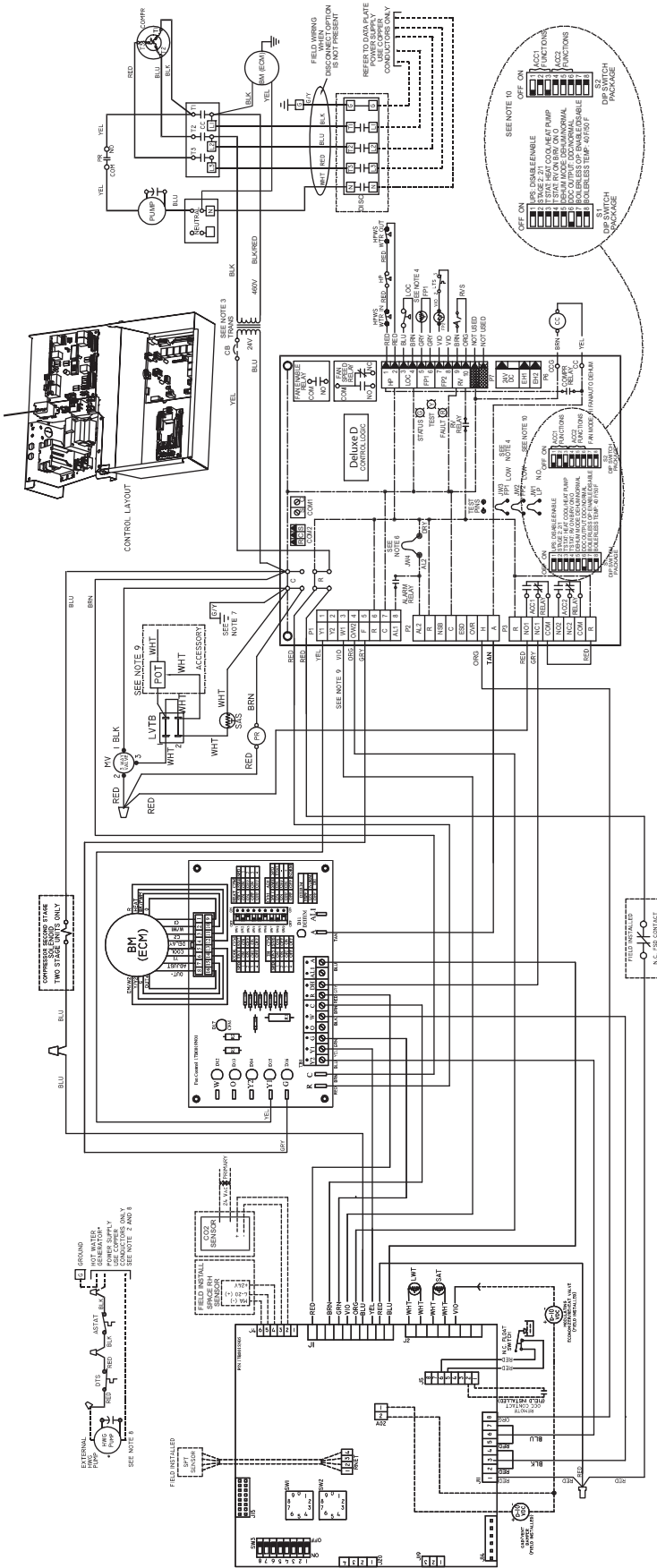
## NOTES:

- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- Transformer is wired to 460 v (BLK/RED) for 460-3-60 units. Transformer is energy limiting or may have circuit breaker.
- FP1 thermistor provides low temperature protection for water. When using antifreeze solutions, cut JW3 jumper.
- Refer to thermostat installation, application, and operation manual for control wiring to the unit. Wire from ECM to "Y" Complete C when a motorized valve is not used.

- Thermostat wiring must be "Class 1" and voltage rating equal to or greater than unit supply voltage.
- 24-v alarm signal shown. For dry alarm contact, cut JW1 jumper and dry contact will be available between AL1 and AL2.
- Transformer secondary ground via green wire with yellow stripe from "C" terminal to control box.
- Aquastat is field-supplied and must be wired in series with the hot leg to the pump. Aquastat is rated for voltage up to 277-v.
- For field-installed 2-position hot water reheat (HWP) coils, disconnect wire from W1 and connect to field-supplied hot water valve.

# Typical control wiring schematics (cont)

## UNITS WITH ECM, HWR, DELUXE D AND WSHWP OPEN CONTROLS, THREE-PHASE (460 V)



### LEGEND

|       |                                      |
|-------|--------------------------------------|
| AL    | Alarm Relay Contacts                 |
| ASTAT | Aquastat                             |
| BM    | Blower Motor                         |
| CB    | Circuit Breaker                      |
| CC    | Compressor Contactor                 |
| DISC  | Unit Disconnect                      |
| DTS   | Discharge Temp Switch                |
| FP1   | Sensor, Water Coil Freeze Protection |
| FP2   | Sensor, Air Coil Freeze Protection   |
| HP    | High-Pressure Switch                 |
| HPWS  | High-Pressure Water Switch           |
| HWG   | Hot Water Generator                  |
| HWR   | Hot Water Reset                      |
| JW    | Jumper Wire                          |
| LAT   | Leaving Air Temperature Switch       |
| LOC   | Loss of Charge Pressure Switch       |
| LVTB  | Low Voltage Terminal Block           |
| LWT   | Leaving Water Temperature            |

|       |                             |
|-------|-----------------------------|
| MV    | Motorized Valve             |
| P1    | Field Wiring Terminal Block |
| PB    | Field Wiring Terminal Block |
| PR    | Pump Relay                  |
| RV    | Reversing Valve             |
| TRANS | Transformer                 |
| ---   | Field Line Voltage Wiring   |
| ---   | Field Low Voltage Wiring    |
| ---   | Printed Circuit Trace       |
| ○     | Relay/Contact Coil          |
| □     | Condensate Pan              |
| ○     | Solenoid Coil               |
| ○     | Thermistor                  |
| ⊥     | Ground                      |
| ⊥     | Wire Nut                    |

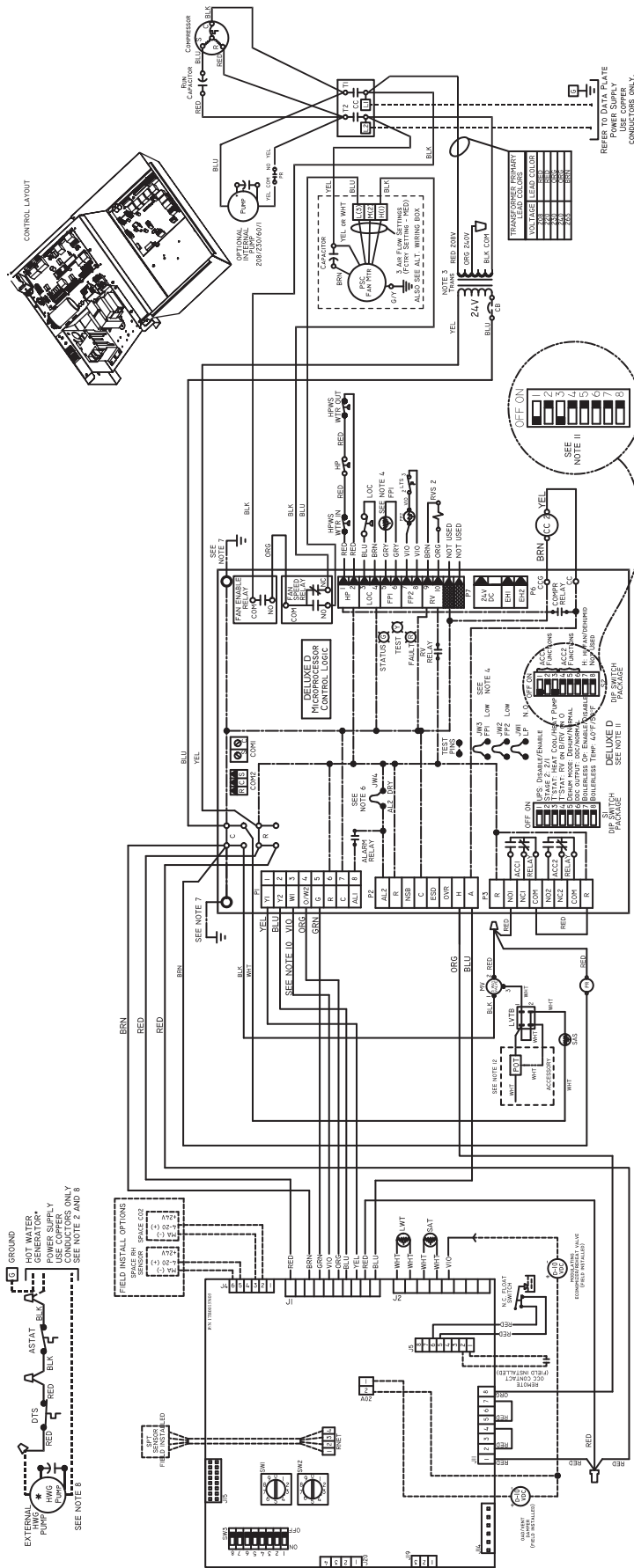
### NOTES:

- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- 208-240 60 Hz units are wired for 208 v operation. For 240 v 60 Hz operation switch RED wire to ORG wire. 220-240 v 50 Hz units are wired for 240 v operation. For 220 v 50 Hz operation switch ORG wire to RED. Transformer is energy limiting or may have circuit breaker.
- FP1 thermistor provides freeze protection for water. When using antifreeze solutions, cut JW3 jumper.
- Refer to humidistat, MPC, LON, or thermostat installation. Application and operation manual for control wiring to the unit. Low voltage wiring must be "Class 1" and

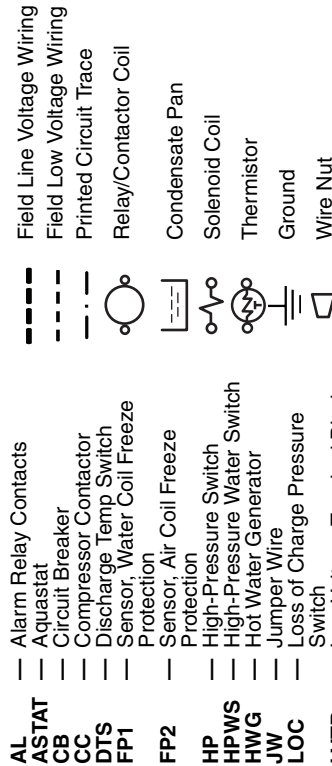
voltage rated equal or greater than unit supply voltage.

- 24-v alarm signal shown. For dry alarm contact, cut J1 jumper and dry contact will be available between AL1 and AL2.
- Transformer secondary ground via green wire with yellow stripe from "C" terminal to control box.
- Commercial units only: Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltages up to 277 v.
- For field-installed 2-position hot water reheat coils disconnect wire from terminal W1 and connect to field-supplied hot water valve.
- Dehumidistat operation (24 vac at H) DIP 2.1 OFF, DIP 2.2 ON, DIP 2.3 OFF. Humidistat operation (0 VAC at H) DIP 2.1 OFF, DIP 2.2 OFF, DIP 2.3 OFF.

# UNITS WITH DELUXE D, PSC, CWR, AND WSHP OPEN CONTROLS



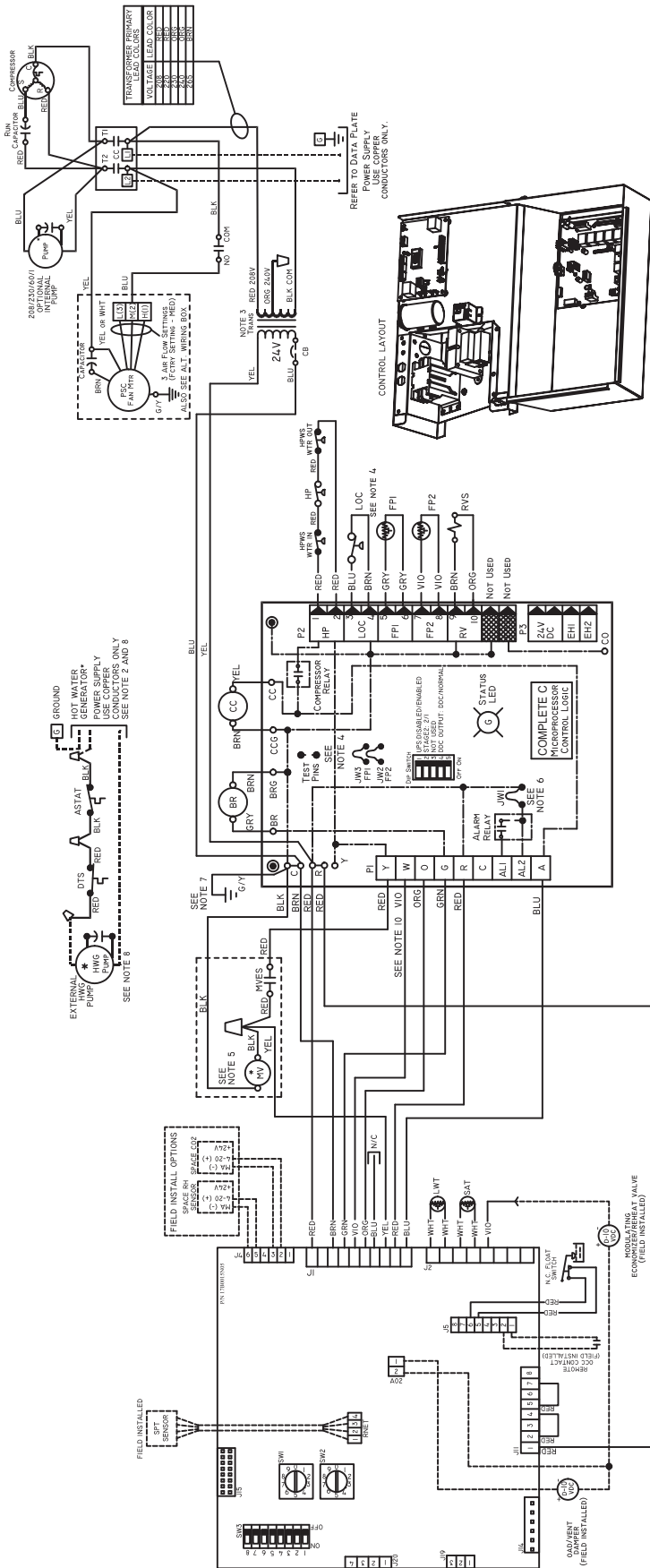
## LEGEND



- Transformer secondary ground via green wire with yellow stripe from "C" terminal to control box.
- Aquastat is supplied with unit and must be wired in series with the hot leg to the pump. Aquastat is rated for voltages up to 277 v.
- Blower motor is factory wired for low and high speeds. For any other combination of speeds, at the motor attach black wire to the higher of the two desired speed taps, and the blue wire to the lower of the two desired speed taps.
- For field-installed 2-position hot water reheat coils disconnect wire from terminal W1 and connect to field-supplied hot water valve.
- Dehumidist operation (24 vac at H) DIP 2.1 OFF, DIP 2.2 ON, DIP 2.3 OFF. Humidistat operation (0 vac at H) DIP 2.1 OFF, DIP 2.2 OFF, DIP 2.3 OFF.
- Remove jumper wire and connect wires for potentiometer accessory option. Place potentiometer label before knob installation.

# Typical control wiring schematics (cont)

## UNITS WITH COMPLETE C, PSC, AND WSHPO OPEN CONTROLS



- 1" and voltage rating equal to or greater than unit supply voltage.
- 24-v alarm signal shown. For dry alarm contact, cut JW1 jumper and dry contact will be available between AL1 and AL2.
- Transformer secondary ground via green wire with yellow stripe from "C" terminal to control box.
- Aquastat is supplied with unit and must be wired in series with the hot leg of the pump. Aquastat is rated for voltages up to 277 V.
- Fan motors are factory wired for medium speed, for high or low speed remove BLU wire from fan motor speed tap "M" and connect to "H" for high or "L" for low. For field-installed 2-position hot water reheat coils disconnect wire from terminal W1 and connect to field-supplied hot water valve.

- Compressor and blower motor thermally protected internally.
- All wiring to the unit must comply with NEC and local codes.
- 208-240 60 Hz units are wired for 208 v operation. For 240 v 60 Hz operation switch red wire to orange wire. 220-240 v 50 Hz units are wired for 240 v operation. For 220 v 50 Hz operation switch orange wire to red. Transformer is energy limiting or may have circuit breaker.
- FP1 thermostat provides freeze protection for water. When using antifreeze solutions, cut JW3 jumper.
- Refer to thermostat installation, application and operation manual for control wiring to the unit. Wire from ECM to "Y" Complete C when a motorized valve is not used. Thermostat wiring must be "Class

### NOTES:

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### LEGEND

| AL    | TRANS                     | Transformer |
|-------|---------------------------|-------------|
| ASTAT | Field Line Voltage Wiring |             |
| BR    | Field Low Voltage Wiring  |             |
| CB    | Printed Circuit Trace     |             |
| CC    | Relay/Contactor Coil      |             |
| DTS   | Condensate Pan            |             |
| FP1   | Solenoid Coil             |             |
| FP2   | Thermistor                |             |
| HP    | Ground                    |             |
| HPWS  | Wire Nut                  |             |
| HWG   |                           |             |
| JW    |                           |             |
| LOC   |                           |             |
| LWT   |                           |             |
| MV    |                           |             |
| MVES  |                           |             |
| P1    |                           |             |
| P1    |                           |             |
| RVS   |                           |             |

\* Optional.

# Application data



Aquazone™ water source heat pump products are available in a flexible, efficient array of models, which can be used in all types of water loop, ground water, and ground loop type systems. Utilize Aquazone products to provide optimal energy efficient solutions and adapt to the most challenging design requirements.

## Water loop system

Water loop (or boiler/tower) system applications typically include a number of units plumbed to a common piping system. For optimal performance, this system should be designed between 2.25 and 3 gpm per ton of cooling capacity. The system is comprised of highly efficient packaged reverse cycle heat pump units interconnected by a water loop. The water circuit serves as both a sink and source for heat absorption and rejection and is designed for entering water temperatures between 60 F and 90 F. Within this temperature range units can heat or cool as required from the same water source. Transferring heat from warm to cold spaces in the building, whenever they coexist, conserves energy rather than creating new heat.

Refer to the **Carrier Water Source Heat Pump System Design Guide** for assistance with the design of water loop systems. The guide includes a practical approach for the latest and most current design recommendations including:

- product application, including horizontal, vertical, console, rooftop and water-to-water applications
- ventilation methods and system design, including energy recovery
- acoustical considerations for different product types
- addressing indoor air quality (IAQ) issues such as condensate removal and humidity control
- air distribution design including diffuser selection/layout and ductwork design
- hydronic system design including pipe sizing/layout and boiler/tower sizing
- control configurations such as standalone, DDC, DCV, and VVT® controls
- Water Source Heat Pump Efficiency/Operational Cost Comparison chart
- system variations such as a system without a boiler, variable pumping, and variable air volume (VAV) for interior use

## Ground water systems

To utilize Aquazone units in ground water applications, extended range should be specified. This will provide factory-installed insulation on the coaxial coil to prevent condensate from dripping when entering water temperatures are below 60 F. In addition, the copper coaxial coil installed on the Aquazone units may not be suitable for all water conditions. Refer to the Water Conditioning section for proper coaxial coil material selection.

**Surface water system** — This system is typically located near a lake or pond. In this application, the loop can be submerged in a series of coils beneath the water surface. The number of coils required depends on system load and design. This application requires minimum piping and excavation.

**Open loop system** — This system is used where ground water is plentiful. In this application, ground water is pumped through supply piping from the well to the building. The water is then pumped back into the ground through a discharge well as it leaves the building. An additional heat exchanger is usually installed between the building water piping system and the ground water piping system. This design limits the amount of piping and excavation required.

Aquazone units are provided with a standard thermostatic expansion valve (TXV) and are rated to extremely low temperatures to self-adjust the refrigeration circuit, therefore water regulating valves are not required on open loop systems. To conserve water on this type of system, a slow opening/closing solenoid valve is recommended.

## Ground loop systems

There are many commonly specified designs for ground loop applications. Typical designs include vertical loops and horizontal loops. In some applications, water is piped from the ground or lake directly to the water source heat pump. Piping is limited to the amount of pipe required to get the water from the source to the unit.

NOTE: When utilizing Aquazone water source heat pumps in ground loop systems, refer to design considerations in the ground water system section.

**Horizontal ground loop** — This system is used when adequate space is available and trenching can be easily accomplished. A series of parallel pipes are laid out in trenches 3 to 6 ft below the ground surface, and then back-filled. Often, multiple pipes are used to maximize the heat transfer capability of each trench. The amount of pipe and the size of the ground loop field are based on ground conditions, heating, and cooling requirements of the application and system design.

**Vertical ground loop** — This system is used in vertical borehole applications. This design is well suited for retrofit applications when space is limited or where landscaping is already complete and minimum disruption of the site is desired. The vertical ground loop system contains a single loop of pipe inserted into a hole. The hole is back-filled and grouted after the pipe is inserted. The completed loop is concealed below ground. The number of loops required depends on ground conditions, heating and cooling requirements, and the depth of each hole.

**Hybrid systems** — In some applications, it may be beneficial to incorporate a cooling tower into the ground loop system to reduce the overall cost. A hybrid system discards excess heat into the air and increases the cooling performance of the ground loop.

## Condensate drainage

**Venting** — Condensate lines should be properly vented to prevent fan pressure from causing water to hang up in the piping. Condensate lines should be pitched to assure full drainage of condensate under all load conditions. Chemical treatment should be provided to remove algae in the condensate pans and drains in geographical areas that are conducive to algae growth.

**Trapping** — Condensate trapping is an essential necessity on every water source heat pump unit. A trap is provided

# Application data (cont)



to prevent the backflow of moisture from the condensate pan and into the fan intake or downstream into the mechanical system. The water seal or the length of the trap depends on the positive or negative pressure on the drain pan. As a rule of thumb, the water seal should be sized for 1 in. for every 1 in. of negative pressure on the unit. The water seal is the distance from the bottom of the unit condensate piping connection to the bottom of the condensate drain line run-out piping. Therefore, the trap size should be double the water seal dimension.

**Horizontal units** — Horizontal units should be sloped toward the drain at a  $\frac{1}{4}$  in. per foot pitch. If it is not possible to meet the pitch requirement, a condensate pump should be designed and installed at the unit to pump condensate to a building drain. Horizontal units are not internally trapped; therefore an external trap is necessary. Each unit must be installed with its own individual trap and means to flush or blow out the condensate drain. The design of a common trap or vent for multiple units is not acceptable. The condensate piping system should not be designed with a pipe size smaller than the drain connection pipe size.

**Vertical units** — Vertical units utilize a condensate hose inside the cabinet that acts as a trapping loop, therefore an external trap is not necessary. Each unit must be installed with its own vent and means to flush or blow out the condensate drain lines. Do not install a common trap or vent on vertical units.

## Water conditioning

In some applications, maintaining proper water quality may require the use of higher corrosion protection for

the water-to-refrigerant heat exchanger. Water quality varies from location to location and is unique for each job. Water characteristics such as pH value, alkalinity, hardness, and specific conductance are of importance when considering any WSHP application. Water typically includes impurities and hardness that must be removed. The required treatment will depend on the water quality as well as type of system. Water problems fall into three main categories:

1. Scale formation caused by hard water reduces the heat transfer rate and increases the water pressure drop through the heat exchanger. As water is heated, minerals and salts are precipitated from a solution and deposited on the inside surface of the pipe or tube.
2. Corrosion is caused by absorption of gases from the air coupled with water on exposed metal. Corrosion is also common in salt-water areas.
3. Organic growths such as algae can reduce the heat transfer rate by forming an insulating coating on the inside tube surface. Algae can also promote corrosion by pitting.

**NOTE:** In most commercial water loop applications, Aquazone™ WSHP units use a copper water-to-refrigerant heat exchanger. Units can also be equipped with a cupronickel heat exchanger for applications where water is outside the standard contaminant limits for a copper heat exchanger.

## WATER QUALITY GUIDELINES

| CONDITION  | HX MATERIAL*  | CLOSED<br>RECIRCULATING†   | OPEN LOOP AND RECIRCULATING WELL**  |
|--|---|--|---|
| <b>Scaling Potential — Primary Measurement</b>   |   |  |   |
| Above the given limits, scaling is likely to occur. Scaling indexes should be calculated using the limits below.   |   |  |   |
| pH/Calcium Hardness Method   | All   | N/A  | pH < 7.5 and Ca Hardness, <100 ppm  |
| <b>Index Limits for Probable Scaling Situations (Operation outside these limits is not recommended.)</b>   |   |  |   |
| Scaling indexes should be calculated at 150 F for direct use and HWG applications, and at 90 F for indirect HX use. A monitoring plan should be implemented. |   |  |   |
| Ryznar Stability Index   | All   | N/A  | <b>6.0 - 7.5</b><br>If >7.5 minimize steel pipe use.  |
| Langelier Saturation Index   | All   | N/A  | <b>-0.5 to +0.5</b><br>If <-0.5 minimize steel pipe use.<br>Based upon 150 F HWG and direct well, 85 F indirect well HX.  |
| <b>Iron Fouling</b>  |   |  |   |
| Iron Fe <sup>2+</sup> (Ferrous) (Bacterial Iron Potential)   | All   | N/A  | <b>&lt;0.2 ppm (Ferrous)</b><br>If Fe <sup>2+</sup> (ferrous) >0.2 ppm with pH 6 - 8, O <sub>2</sub> <5 ppm check for iron bacteria.  |
| Iron Fouling   | All   | N/A  | <b>&lt;0.5 ppm of Oxygen</b><br>Above this level deposition will occur.   |
| <b>Corrosion Prevention††</b>  |   |  |   |
| pH   | All   | 6 - 8.5<br>Monitor/treat as needed.  | <b>6 - 8.5</b><br>Minimize steel pipe below 7 and no open tanks with pH <8.   |
| Hydrogen Sulfide (H <sub>2</sub> S)  | All   | N/A  | <b>&lt;0.5 ppm</b><br>At H <sub>2</sub> S>0.2 ppm, avoid use of copper and cupronickel piping or HXs.<br>Rotten egg smell appears at 0.5 ppm level.<br>Copper alloy (bronze or brass) cast components are okay to <0.5 ppm. |
| Ammonia Ion as Hydroxide, Chloride, Nitrate and Sulfate Compounds  | All   | N/A  | <b>&lt;0.5 ppm</b>  |
| Maximum Chloride Levels  | Copper<br>Cupronickel<br>304 SS<br>316 SS<br>Titanium | N/A<br>N/A<br>N/A<br>N/A<br>N/A  | Maximum allowable at maximum water temperature.   |
|  |   |  | 50 F (10 C)      75 F (24 C)      100 F (38 C)  |
|  |   |  | <20 ppm      NR      NR   |
|  |   |  | <150 ppm      NR      NR  |
|  |   |  | <400 ppm      <250 ppm      <150 ppm  |
|  |   |  | <1000 ppm      <550 ppm      <375 ppm   |
|  |   |  | >1000 ppm      >550 ppm      >375 ppm   |
| <b>Erosion and Clogging</b>  |   |  |   |
| Particulate Size and Erosion   | All   | <10 ppm of particles and a maximum velocity of 6 fps.<br>Filtered for maximum 800 micron size. | <10 ppm (<1 ppm "sandfree" for reinjection) of particles and a maximum velocity of 6 fps. Filtered for maximum 800 micron size. Any particulate that is not removed can potentially clog components.                        |
| Brackish   | All   | N/A  | Use cupronickel heat exchanger when concentrations of calcium or sodium chloride are greater than 125 ppm are present. (Seawater is approximately 25,000 ppm.)  |

### LEGEND

**HWG** — Hot Water Generator  
**HX** — Heat Exchanger  
**N/A** — Design Limits Not Applicable Considering Recirculating Potable Water  
**NR** — Application Not Recommended  
**SS** — Stainless Steel

\*Heat exchanger materials considered are copper, cupronickel, 304 SS (stainless steel), 316 SS, titanium.

†Closed recirculating system is identified by a closed pressurized piping system.

\*\*Recirculating open wells should observe the open recirculating design considerations.

††If the concentration of these corrosives exceeds the maximum allowable level, then the potential for serious corrosion problems exists.

Sulfides in the water quickly oxidize when exposed to air, requiring that no agitation occur as the sample is taken. Unless tested immediately at the site, the sample will require stabilization with a few drops of one Molar zinc acetate solution, allowing accurate sulfide determination up to 24 hours after sampling. A low pH and high alkalinity can cause system problems, even when both values are within ranges shown. The term pH refers to the acidity, basicity, or neutrality of the water supply. Below 7.0, the water is considered to be acidic. Above 7.0, water is considered to be basic. Neutral water contains a pH of 7.0.

To convert ppm to grains per gallon, divide by 17. Hardness in mg/l is equivalent to ppm.

# Application data (cont)



## COMPLETE C AND DELUXE D ELECTRONIC CONTROL FEATURES COMPARISON

| BASIC FEATURES   | COMPLETE C | COMPLETE C WITH LON | DELUXE D | DELUXE D WITH LON | COMPLETE C OR DELUXE D WITH WSHP OPEN CONTROLLER |
|--|------------|---------------------|----------|-------------------|--|
| High and Low Refrigerant Pressure Protection               | S          | S                   | S        | S                 | S  |
| Water Coil Freeze Protection                               | S          | S                   | S        | S                 | S  |
| True 24 VA Thermostat Signals                              | S          | S                   | S        | S                 | S  |
| Thermostat Inputs Compatible with Triacs                   | S          | S                   | S        | S                 | S  |
| Condensate Overflow Sensor                                 | S          | S                   | S        | S                 | S  |
| Anti-Short-Cycle Time Delay                                | S          | S                   | S        | S                 | S  |
| Random Start   | S          | S                   | S        | S                 | S  |
| Alarm (selectable dry contact or 24 VA)                    | S          | S                   | S        | S                 | S  |
| Water Valve Relay  | S          | S                   | S        | S                 | S  |
| Water Valve Relay with Compressor Delay                    | N/A        | N/A                 | S        | S                 | S  |
| Emergency Shutdown   | N/A        | DDC                 | S        | DDC               | DDC  |
| Night Setback with Override                                | N/A        | DDC                 | S        | DDC               | DDC  |
| Outdoor Air Damper Control                                 | N/A        | N/A                 | S        | S                 | S  |
| ADVANCED FEATURES  |            |                     |          |                   |  |
| Intelligent Reset  | S          | S                   | S        | S                 | S  |
| High and Low Voltage Protection                            | S          | S                   | S        | S                 | S  |
| Air Coil Low temperature Cutout                            | S          | S                   | S        | S                 | S  |
| Low Temperature Set Point Field Select (water, antifreeze) | S          | S                   | S        | S                 | S  |
| Electric Heat Control Outputs                              | S          | S                   | S        | S                 | S  |
| Boilerless Electric Heat Control                           | N/A        | N/A                 | S        | S                 | S  |
| Intelligent Reversing Valve Operation                      | N/A        | DDC                 | S        | S                 | S  |
| High/Low Fan Speed Outputs                                 | N/A        | N/A                 | S        | S                 | S  |
| Intelligent Fan Speed Control                              | N/A        | N/A                 | S        | S                 | S  |
| Thermostat Type Select (Y,O or Y,W)                        | N/A        | N/A                 | S        | N/A               | N/A  |
| Reversing Valve Signal Select (O or B)                     | N/A        | N/A                 | S        | N/A               | N/A  |
| Dehumidistat Input   | N/A        | N/A                 | S        | S                 | S  |
| Reheat Dehumidification Control                            | N/A        | N/A                 | O        | O                 | O  |
| Multiple Units on One Thermostat/Wall Sensor               | N/A        | DDC                 | S        | DDC               | DDC  |
| Condenser Waterside/Airside Linkage                        | N/A        | N/A                 | N/A      | N/A               | S  |
| Waterside Economizer                                       | N/A        | N/A                 | N/A      | N/A               | S  |
| Proactive Diagnostics                                      | N/A        | N/A                 | N/A      | N/A               | S  |
| CO <sub>2</sub> Sensor Capable                             | N/A        | N/A                 | N/A      | N/A               | S  |
| IAQ Capable  | N/A        | N/A                 | N/A      | N/A               | S  |
| SERVICE AND RELIABILITY FEATURES                           |            |                     |          |                   |  |
| Service Test Mode  | S          | S                   | S        | S                 | S  |
| LED Fault and Status Lights                                | S          | S                   | S        | S                 | S  |
| Fault Memory After Reset                                   | S          | S                   | S        | S                 | S  |
| Unit Performance Sentinel                                  | S          | S                   | S        | S                 | S  |
| Harness-Type Factory Wiring Connections                    | S          | S                   | S        | S                 | S  |
| Fully Noise-Tested Design                                  | S          | S                   | S        | S                 | S  |
| CE Approval  | S          | S                   | S        | S                 | S  |
| Removable Low Voltage Connector                            | N/A        | N/A                 | S        | S                 | S  |
| DDC/ENERGY MANAGEMENT FEATURES                             |            |                     |          |                   |  |
| LONMark Compliant  | N/A        | S                   | N/A      | S                 | S  |
| BACnet Compliant   | N/A        | N/A                 | N/A      | N/A               | S  |
| Johnson N2 Compliant                                       | N/A        | N/A                 | N/A      | N/A               | S  |
| Modbus Compliant   | N/A        | N/A                 | N/A      | N/A               | S  |
| Leaving Air and Water Temperature Sensor                   | N/A        | S                   | N/A      | S                 | S  |
| Digital Wall Sensor  | N/A        | O                   | N/A      | O                 | O  |

### LEGEND

**Complete C** — Complete C Control System  
**DDC** — Direct Digital Controls  
**Deluxe D** — Deluxe D Control System  
**IAQ** — Indoor Air Quality

**LON** — LONMark Controller  
**N/A** — Not Available  
**O** — Optional  
**S** — Standard

## Acoustical design

Sound power levels represent the sound as it is produced by the source, the WSHP unit, with no regard to attenuation between the source and the space. Acoustical design goals are necessary to provide criteria for occupied spaces where people can be comfortable and communicate effectively over the background noise of the air-conditioning system and other background noise sources.

Acoustical design goals are desirable sound pressure levels within a given conditioned space and are represented by noise criteria (NC) curves. The NC curve levels represent a peak over a full spectrum of frequencies. A high value in a low frequency band has the same effect on NC level as a lower value in a high frequency band. It is important that sound levels be balanced over the entire spectrum relative to the NC curve. The lower the NC criteria curve, the more stringent the room acoustical design must be to meet the design goals.

It is important to know how to convert NC levels from the unit ratings in terms of sound power (Lw). This conversion depends on the specifics of the acoustical environment of the installation.

The resulting calculations are compared to the NC curve selected for the area to assess the acoustical design.

Some of the factors that affect conversion of sound power to sound pressure and consequent NC level include:

- type of acoustical ceiling
- use of metal or flex duct
- absorption in the occupied space
- location in the occupied space
- open or closed layout plan
- use of open or ducted returns
- orientation of unit to occupant
- use of lined or unlined duct

## WSHP sound control

The analysis of the projected sound level in the conditioned space caused by a WSHP unit located in a ceiling plenum is quite involved. The key is to have good sound power ratings (Lw) in dB on the equipment to determine the sound attenuation effect of the ductwork, ceiling and room. In combination with utilizing standard Aquazone™ equipment attenuating features or the advanced mute package features, suggestions for horizontal and vertical unit sound design are provided to design around the WSHP units.

## Horizontal units

Use the following guidelines for layout of Aquazone horizontal units to minimize noise:

1. Obtain sound power ratings in accordance with latest standards from manufacturers to select quietest equipment.
2. Do not locate units over a space with a required NC of 40 or less. Instead, locate units above less sensitive noise areas such as above or in equipment rooms, utility closets, restrooms, storage rooms, or above corridors.
3. Provide at least 10 feet between WSHP units to avoid the additive effect of two noise sources.

4. Provide an acoustical pad underneath the WSHP unit in applications where the unit must be mounted above noise sensitive areas such as private offices or conference rooms. The pad attenuates radiated noise. Be sure the pad has an area at least twice that of the WSHP footprint.
5. Maximize the installed height above the suspended ceiling.
6. Be sure the WSHP unit is located at least 6 feet away from any ceiling return grille to prevent line-of-sight casing noise to reach the space below.
7. Suspend the WSHP unit from the ceiling with hangers that utilize spring or neoprene type isolators to reduce vibration transmission.
8. Utilize flexible electrical connections to the WSHP unit. **DO NOT USE NOT RIGID CONNECTIONS.**
9. Utilize flexible loop water and condensate piping connections to the WSHP unit.
10. Use a canvas duct connector to connect the WSHP discharge to the downstream duct system. This reduces vibration-induced noise.
11. Provide acoustic interior lining for the first 20 feet of discharge duct, or until the first elbow is reached. The elbow prevents line-of-site sound transmission in the discharge duct.
12. Provide turning vanes in ductwork elbows and tees to reduce air turbulence.
13. Size the sheet metal supply duct with velocities no greater than 1000 fpm.
14. Ensure ductwork is rigid.
15. Use round duct whenever possible to further reduce noise.
16. Allow at least 3 equivalent duct diameters of straight duct upstream and downstream of the unit before allowing any fittings, transitions, etc.
17. Seal all penetrations around duct entering the space.
18. Provide a 4-ft run-out duct made of flexible material to connect a diffuser to the supply trunk duct. The flex duct provides an “attenuating end-effect” and reduces duct-transmitted sound before it reaches the space. Typically a 6 dB sound reduction can be accomplished with the use of flex duct.
19. Locate the run-out duct balancing damper as far away from the outlet diffuser as possible. Locating the balancing damper at the trunk duct exit is the best location.
20. If return air is drawn through a ceiling plenum, provide an acoustically lined return duct elbow or “L” shaped boot at the WSHP to eliminate line-of-sight noise into the ceiling cavity and possibly through ceiling return air grilles. Face the elbow or boot away from the nearest adjacent WSHP unit to prevent additive noise.
21. Do not hang suspended ceiling from the ductwork.

# Application data (cont)



## Vertical units

All guidelines established for horizontal units also apply for vertical units. In addition, since vertical units tend to be installed in small equipment rooms or closets, the following additional guidelines apply:

1. Mount the unit on a pad made of high-density sound absorbing material such as rubber or cork. Extend the pad beyond the WSHP unit footprint by at least 6 inches in each direction.
2. Since the unit returns airflow through a grille mounted in a closet door, provide a sound barrier or some other modification of the closet to prevent line-of-sight noise into the space.
3. Follow good duct design practice in sizing and locating the connection of the WSHP discharge to the supply duct system. Use an elbow with turning vanes and bent in the direction of the fan rotation to minimize turbulence. Make any duct transitions as smooth and as gradual as possible to again minimize turbulence and loss of fan static pressure.

## Motorized water control valves

In applications using variable flow pumping, motorized water valves can be field-installed and operated from the control board in the Aquazone™ WSHP unit. Motorized water valve is a slow-closing (ON/OFF) quiet operation with 24 vac, end switch and standard normally closed.

## Freeze protection

Applications where systems are exposed to outdoor temperatures below freezing (32 F) must be protected from freezing. The most common method of protecting water systems from freezing is adding glycol concentrations into the water. Design care should be used when selecting both the type and concentrations of glycol utilized due to the following:

- Equipment and performance may suffer with high concentrations of glycol and other antifreeze solutions.
- Loss of piping pressure may increase greatly, resulting in higher pumping costs.

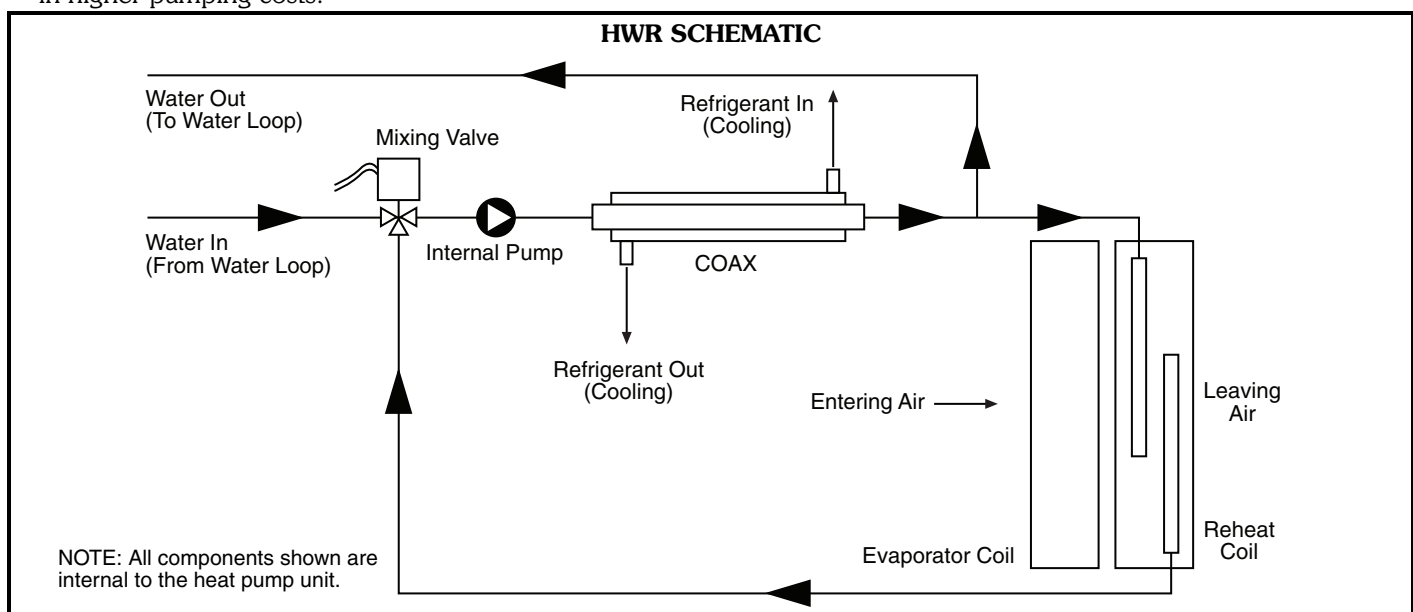
- Higher viscosity of the mixture may cause excess corrosion and wear on the entire system.
- Acidity of the water may be greatly increased, promoting corrosion.
- Glycol promotes galvanic corrosion in systems of dissimilar metals. The result is corrosion of one metal by the other, causing leaks.

## Dehumidification

For dehumidification, Carrier has provided a modulating hot water reheat (HWR) function that meets and exceeds those specifications that call for hot gas reheat (HGR). Modulating HWR is a relatively new design that controls dehumidification by providing modulating HWR based on the desired leaving air temperature set point. Unlike the complicated refrigerant circuitry used in HGR, Carrier's HWR utilizes the condenser water and a water-to-air reheat coil, placed after the evaporator coil, to reheat the return air after it is conditioned by the air-to-refrigerant evaporator coil, providing 100% reheat regardless of season and water temperature. See figure below.

Heat pumps with HWR having a sensible-to-total (S/T) ratio of 0.72 to 0.76 dedicate 25% of their total cooling capacity to moisture removal. When selecting a unit for both sensible and latent cooling, it is necessary to pay close attention to the latent cooling of the unit to ensure that the latent cooling load is satisfied by the unit selection. If the latent cooling load is not satisfied, then a larger unit with enough latent cooling is required for that specific application.

Unlike most hot gas reheat options, the HWR option will operate over a wide range of entering-water temperatures (EWTs). Special flow regulation (water regulating valve) is not required for low EWT conditions. However, below 55 F, supply-air temperatures cannot be maintained at 72 F because the cooling capacity exceeds the reheat coil capacity at low water temperatures. Below 55 F, essentially all water is diverted to the reheat coil (no heat of rejection to the building loop).



Although the HWR option will work fine with low EWTs, overcooling of the space may result with well water systems or, on rare occasions, with ground loop (geothermal) systems. (NOTE: Extended range units are required for well water and ground loop systems.) Since dehumidification is generally only required in cooling, most ground loop systems will not experience overcooling of the supply-air temperature. If overcooling of the space is a concern (e.g., computer room well water application), auxiliary heating may be required to maintain space temperature when the unit is operating in the dehumidification mode. Water source heat pumps with HWR should not be used as makeup air units. These applications should use equipment specifically designed for makeup air.

### HWR sequence of operation

A heat pump with HWR can operate in three modes; cooling, cooling with reheat (dehumidification), and heating. The cooling/heating modes are like any other WSHP. The reversing valve (O signal) is energized in cooling, along with the compressor contactor(s) and blower relay. In the heating mode the reversing valve is de-energized. Almost any thermostat will activate the heat pump in heating or cooling modes. The Deluxe D microprocessor board, which is required with the HWR option, will accept either heat pump (Y,O) thermostats or non-heat pump (Y,W) thermostats. The reheat mode requires either a separate humidistat/dehumidistat or a thermostat that has an integrated dehumidification function for activation. The Deluxe D board is configured to work with either a humidistat or dehumidistat input to terminal H. Upon receiving an H input, the Deluxe D board will activate the cooling mode and engage reheat.

There are four operational inputs for single-stage units and six operational inputs for dual-stage units:

- Fan Only
- First Stage Cooling
- Second Stage Cooling
- First Stage Heating
- Second Stage Heating
- Reheat Mode.

**Fan Only:** A (G) call from the thermostat to the (G) terminal of the Deluxe D control board will bring the unit on in fan only mode.

**First Stage Cooling:** A simultaneous call from (G), (Y1), and (O) to the (G), (Y1), (O/W2) terminals of the Deluxe D control board will bring the unit on in First Stage Cooling.

**Second Stage Cooling:** A simultaneous call from (G), (Y1), (Y2), and (O) to the (G), (Y1), (Y2), and (O/W2) terminals of the Deluxe D control board will bring the unit on in Second Stage Cooling. When the call is satisfied at the thermostat the unit will continue to run in First Stage Cooling until the First Stage Cooling call is removed or satisfied, shutting down the unit.

NOTE: Not all units have two-stage cooling functionality.

**First Stage Heating:** A simultaneous call from (G) and (Y1) to the (G) and (Y1) terminals of the Deluxe D control board will bring the unit on in First Stage Heating.

**Second Stage Heating:** A simultaneous call from (G), (Y1), and (Y2) to the (G), (Y1), and (Y2) terminals of the Deluxe D control board will bring the unit on in Second Stage Heating. When the call is satisfied at the thermostat the unit will continue to run in First Stage Heating until the call is removed or satisfied, shutting down the unit.

NOTE: Not all units have two-stage heating functionality.

**Reheat Mode:** A call from the Humidistat/Dehumidistat to the (H) terminal of the Deluxe D control board will bring the unit on in Reheat Mode if there is no call for cooling at the thermostat. When the Humidistat/Dehumidification call is removed or satisfied the unit will shut down.

NOTE: Cooling always overrides Reheat Mode. In the Cooling mode, the unit cools and dehumidifies. If the cooling thermostat is satisfied but there is still a call for dehumidification, the unit will continue to operate in Reheat Mode. Care must be taken when using a humidistat to operate HWR. When the DIP switch on the Deluxe D controller is set for humidistat, it reverses the control logic so that an open control circuit initiates a HWR run cycle. If a humidistat is not connected, or if a manual switch on the humidistat is set to off, HWR will see the open circuit and call for dehumidification.

See tables on the next page for Deluxe D DIP switch settings and HWR operating modes.

### HWR component functions

The HWR option consists of the following components:

- Motorized valve/proportional controller
- Supply air sensor
- Loop pump
- Hydronic coil
- Low pressure switch.

The proportional controller operates on 24 VAC power supply and automatically adjusts the water valve based on the supply air sensor. The supply-air sensor senses supply air temperature at the blower inlet providing the input signal necessary for the proportional control to drive the motorized valve during the reheat mode of operation. The motorized valve is a proportional actuator/three-way valve combination used to divert the condenser water from the coax to the hydronic reheat coil during the reheat mode of operation. The proportional controller signals the motorized valve based on the supply-air temperature of the supply-air sensor.

The loop pump circulates condenser water through the hydronic reheat coil during the reheat mode of operation. In this application, the loop pump is only energized during the reheat mode of operation.

The hydronic coil is utilized during the reheat mode of operation to reheat the air to the setpoint of the proportional controller. Condenser water is diverted by the motorized valve and pumped through the hydronic coil by the loop pump in proportion to the control setpoint. The amount of reheating is dependent on the setpoint and how far from setpoint the supply air temperature is. The factory setpoint is 72 F (22 C), generally considered “neutral” air.

# Application data (cont)



## HWR application considerations

The reheat coil adds a small amount of resistance to the air stream. In some cases the high static option may be required for applications with higher static ductwork. Consult the submittal data or the Installation Manual for the specific heat pump to review blower tables. Unlike most hot gas reheat options, the HWR option will operate over a wide range of EWTs. Special flow regulation (water regulating valve) is not required for low EWT conditions.

Water-source heat pumps with HWR should not be used as make-up air units. These applications should use equipment specifically designed for make-up air.

## HUMISTAT/DEHUMISTAT LOGIC AND DELUXE D CONTROLLER (2.1, 2.2, 2.3) DIP SWITCH SETTINGS

| SENSOR       | 2.1 | 2.2 | 2.3 | LOGIC    | REHEAT (ON) - H | REHEAT (OFF) - H |
|--------------|-----|-----|-----|----------|-----------------|------------------|
| Humidistat   | OFF | OFF | OFF | Reverse  | 0 vac           | 24 vac           |
| Dehumidistat | OFF | ON  | OFF | Standard | 24 vac          | 0 vac            |

## HWR OPERATING MODES

| MODE                           | INPUT  |     |     |        |     | OUTPUT |     |     |        |        |
|--------------------------------|--------|-----|-----|--------|-----|--------|-----|-----|--------|--------|
|                                | O      | G   | Y1  | Y2*    | H   | O      | G   | Y1  | Y2*    | REHEAT |
| No Demand                      | ON/OFF | OFF | OFF | OFF    | OFF | ON/OFF | OFF | OFF | OFF    | OFF    |
| Fan Only                       | ON/OFF | ON  | OFF | OFF    | OFF | ON/OFF | ON  | OFF | OFF    | OFF    |
| Cooling First Stage            | ON     | ON  | ON  | OFF    | OFF | ON     | ON  | ON  | OFF    | OFF    |
| Cooling Second Stage           | ON     | ON  | ON  | ON     | OFF | ON     | ON  | ON  | ON     | OFF    |
| Cooling and Dehumidstat†       | ON     | ON  | ON  | ON/OFF | ON  | ON     | ON  | ON  | ON/OFF | OFF    |
| Dehumidstat Only               | ON/OFF | OFF | OFF | OFF    | ON  | ON     | ON  | ON  | ON     | ON     |
| Heating First Stage            | OFF    | ON  | ON  | OFF    | OFF | OFF    | ON  | ON  | OFF    | OFF    |
| Heating Second Stage           | OFF    | ON  | ON  | ON     | OFF | OFF    | ON  | ON  | ON     | OFF    |
| Heating and Dehumidification** | OFF    | ON  | ON  | ON/OFF | ON  | OFF    | ON  | ON  | ON/OFF | OFF    |

\*N/A for single stage units. Full load operation for dual capacity units.

†Cooling input takes priority over dehumidify input.

\*\*Deluxe D is programmed to ignore the H demand when the unit is in the heating mode.

NOTE: ON/OFF = either on or off.

## WSHP Open sequence of operation

The WSHP Open multi-protocol controller will control mechanical cooling, heating and waterside economizer outputs based on its own space temperature input and set points. An optional CO<sub>2</sub> IAQ (indoor air quality) sensor mounted in the space can maximize the occupant comfort. The WSHP Open controller has its own hardware clock that is automatically set when the heat pump software is downloaded to the board. Occupancy types are described in the scheduling section below. The following sections describe the functionality of the WSHP Open multi-protocol controller. All point objects referred to in this sequence of operation will be referenced to the objects as viewed in the BACview<sup>6</sup> handheld user interface.

**Scheduling** — Scheduling is used to start/stop the unit based on a time period to control the space temperature to specified occupied heating and cooling set points. The controller is defaulted to control by occupied set points all the time, until either a time schedule is configured with BACview<sup>6</sup>, Field Assistant, i-Vu<sup>®</sup> Open, or a third party control system to enable/disable the BAS (Building Automation System) on/off point. The local time and date must be set for these functions to operate properly. The occupancy source can be changed to one of the following:

Occupancy schedules — The controller will be occupied 24/7 until a time schedule has been configured using either Field Assistant, i-Vu Open, BACview<sup>6</sup> or a third party control system to enable/disable the BAS on/off point. The BAS point can be disabled by going to Config, then Unit, then Occupancy Schedules and changing the point from enable to disable then clicking OK.

NOTE: This point must be enabled in order for the i-Vu Open, Field Assistant, or BACview<sup>6</sup> control system to assign a time schedule to the controller.

Schedule schedule — The unit will operate according to the schedule configured and stored in the unit. The schedule is accessible via the BACview<sup>6</sup> handheld tool, i-Vu Open, or Field Assistant control system. The daily schedule consists of a start/stop time (standard or 24-hour mode) and seven days of the week, starting with Monday and ending on Sunday. To enter a daily schedule, navigate to Config, then Sched, then enter BACview<sup>6</sup> Admin Password (1111), then go to schedule\_schedule. From here, enter either a Weekly or Exception schedule for the unit.

Occupancy input contact (option) — If configured for remote occupancy control (default), the WSHP Open controller has the capability to use an external dry contact closure to determine the occupancy status of the unit. The Occupancy Schedules will need to be disabled in order to utilize the occupancy contact input. The control will cause the unit to go into occupied mode whenever the abnormal input is sensed. After the input returns to its normal state, the unit will stay in the occupied mode for the configured Occ Override Delay period (15 minutes default).

NOTE: Scheduling can only be controlled from one source.

BAS (Building Automation System) on/off — A BAS system that supports network scheduling can control the unit through a network communication and the BAS scheduling function once the Occupancy Schedules have been disabled.

NOTE: Scheduling can only be controlled from one source.

Global occupancy scheduling — The WSHP Open controller has the capability to read the occupancy status from another unit so that a group of WSHP Open controllers can be controlled from a single occupancy schedule. The local occupancy schedules must be disabled in order to utilize the global occupancy input.

NOTE: Scheduling can only be controlled from one source.

BACnet network occupancy input — The WSHP Open controller has the capability to accept an external BACnet binary network input for occupancy control. This function is only compatible with units used in BACnet systems. The BACnet network input point "System Occupancy" is configured to locate the device and point name where the external occupancy point information resides. Also occupancy schedules must be disabled in order to utilize this input.

NOTE: Scheduling can only be controlled from one source.

**Fire/smoke detector input** — The WSHP Open controller has the capability to read the status of a normally-closed (NC) fire/smoke detector contact input to determine if a fire or smoke detector alarm is present. If the controller determines an alarm condition is present, all heating, cooling and the fan are disabled. The normal state of the switch is factory set to normally-closed and cannot be changed.

**Shutdown input** — The WSHP Open controller has a shutdown input (software point) which when set to its 'Active' mode will cause the WSHP to safely shut down in a controlled fashion. Heating and cooling will be disabled after any minimum runtime conditions expire and the fan will be disabled after the fan off timer expires. All alarms are reset but any active alarm will remain active. After the shutdown input transitions from 'Active' mode to 'Inactive', the WSHP Open controller will restart after the configured power fail restart delay expires.

**Indoor fan** — The indoor fan will operate in any one of three modes depending on the user configuration selected.

Fan mode can be selected as Auto, Continuous, or Always On. In Auto mode, the fan is in intermittent operation during both occupied and unoccupied periods. Continuous fan mode is intermittent during unoccupied periods and continuous during occupied periods. Always On mode operates the fan continuously during both occupied and unoccupied periods. In the default mode, Continuous, the fan will be turned on whenever any one of the following is true:

- The unit is in occupied mode as determined by its occupancy status.
- There is a demand for cooling or heating in the unoccupied mode.
- There is a call for dehumidification (optional).

# Controls (cont)



When power is reapplied after a power outage, there will be a configured time delay of 5 to 600 seconds before starting the fan. There are also configured fan delays for Fan On and Fan Off. The Fan On delay defines the delay time (0 to 30 seconds; default 10) before the fan begins to operate after heating or cooling is started while the Fan Off delay defines the delay time (0 to 180 seconds; default 45) the fan will continue to operate after heating or cooling is stopped. The fan will continue to run as long as the compressors, heating stages, or the dehumidification relays are on. If the space temperature (SPT) failure alarm or condensate overflow alarm is active; the fan will be shut down immediately regardless of occupancy state or demand.

**Automatic fan speed control** — The WSHP OPEN is capable of controlling up to three fan speeds using the ECM (electronically commutated motor). The motor will operate at the lowest speed possible to provide quiet and efficient fan operation with the best latent capability. The motor will increase speed if additional cooling or heating is required to obtain the desired space temperature set point. The control increases the motor's speed as the space temperature rises above the cooling or below the heating set point. The amount of space temperature increase above or below the set point required to increase the fan speed is user configurable in the set point. Also, the control will increase the fan speed as the supply-air temperature (SAT) approaches the configured minimum or maximum limits.

**Fan speed control (during heating)** — Whenever heat is required and active, the control continuously monitors the supply-air temperature to verify it does not rise above the configured maximum heating SAT limit (110 F default). As the SAT approaches this value, the control will increase the fan speed as required to ensure the SAT will remain within the limit. This feature provides the most quiet and efficient operation by operating the fan at the lowest speed possible.

**Fan speed control (during cooling)** — Whenever mechanical cooling is required and active, the control continuously monitors the supply-air temperature to verify it does not fall below the configured minimum cooling SAT limit (50 F default). As the SAT approaches this value, the control will increase the fan speed as required to ensure the SAT will remain within the limit. The fan will operate at lowest speed to maximize latent capacity during cooling.

**Fan status (option)** — An optional input can be configured as either an occupancy input contact or a fan status input. If configured as fan status, the controller will compare the status of the fan to the desired commanded state. Whenever the fan is commanded to run (ON), the fan status will be checked and verified to match the commanded state. If the fan status is not on, then a fan status alarm will be generated after 1 minute and the equipment's compressor(s) and auxiliary heat will be disabled and the optional OA damper will close.

**Cooling** — The WSHP Open controller will operate one or two stages of compression to maintain the desired cooling set point. The compressor outputs are controlled by the PI (proportional-integral) cooling loop and cooling stages capacity algorithm. They will be used to calculate the desired number of stages needed to satisfy the space by

comparing the space temperature (SPT) to the appropriate cooling set point. The water-side economizer, if applicable, will be used for first stage cooling in addition to the compressor(s). The following conditions must be true in order for the cooling algorithm to run:

- Cooling is set to Enable.
- The fire/smoke input and shutdown modes are inactive.
- Heating mode is not active and the compressor time guard has expired.
- Condensate overflow input is normal.
- If occupied, the SPT is greater than the occupied cooling set point.
- Space temperature reading is valid.
- If unoccupied, the SPT is greater than the unoccupied cooling set point.
- If economizer cooling is available and active and the economizer alone is insufficient to provide enough cooling.
- OAT (if available) is greater than the cooling lockout temperature.
- Condenser water pump is on (condenser water linkage is active).

If all the above conditions are met, the compressors will be energized as required, otherwise they will be deenergized. If cooling is active and should the SAT approach the minimum SAT limit, the fan will be indexed to the next higher speed. Should this be insufficient and if the SAT falls further (equal to the minimum SAT limit), the fan will be indexed to the maximum speed. If the SAT continues to fall 5° F below the minimum SAT limit, all cooling stages will be disabled.

During Cooling mode, the reversing valve output will be held in the cooling position (either B or O type as configured) even after the compressor is stopped. The valve will not switch position until the Heating mode is required.

The configuration screens contain the minimum SAT parameter as well as cooling lockout based on outdoor-air temperature (OAT). Both can be adjusted to meet various specifications.

There is a 5-minute off time for the compressor as well as a 5-minute time delay when staging up to allow the SAT to achieve a stable temperature before energizing a second stage of capacity. Likewise, a 45-second delay is used when staging down.

After a compressor is staged off, it may be restarted again after a normal time-guard period of 5 minutes and if the supply-air temperature has increase above the minimum supply-air temperature limit.

The WSHP Open controller provides a status input to monitor the compressor operation. The status is monitored to determine if the compressor status matches the commanded state. This input is used to determine if a refrigerant safety switch or other safety device has tripped and caused the compressor to stop operating normally. If this should occur, an alarm will be generated to indicate the faulted compressor condition.

**Reverse cycle heating** — The WSHP Open controller will operate one or two stages of compression to maintain the desired heating set point. The compressor outputs are

controlled by the heating PI (proportional-integral) loop and heating stages capacity algorithm. They will be used to calculate the desired number of stages needed to satisfy the space by comparing the space temperature (SPT) to the appropriate heating set point. The following conditions must be true in order for the heating algorithm to run:

- Heating is set to Enable.
- The fire/smoke input and shutdown modes are inactive.
- Cooling mode is not active and the compressor time guard has expired.
- Condensate overflow input is normal.
- Fan Status is true (if option is enabled)
- If occupied, the SPT is less than the occupied heating set point.
- Space temperature reading is valid.
- If unoccupied, the SPT is less than the unoccupied heating set point.
- OAT (if available) is less than the heating lockout temperature.
- Condenser water pump is on (if condenser water linkage is active).

If all the above conditions are met, the heating outputs will be energized as required, otherwise they will be deenergized. If the heating is active and should the SAT approach the maximum SAT limit, the fan will be indexed to the next higher speed. Should this be insufficient, and the SAT rises further reaching the maximum heating SAT limit, the fan will be indexed to the maximum speed. If the SAT still continues to rise 5° F above the maximum limit, all heating stages will be disabled.

During Heating mode, the reversing valve output will be held in the heating position (either B or O type as configured) even after the compressor is stopped. The valve will not switch position until the Cooling mode is required.

The configuration screens contain the maximum SAT parameter as well as heating lockout based on outdoor-air temperature (OAT); both can be adjusted to meet various specifications.

There is a 5-minute off time for the compressor as well as a 5-minute time delay when staging up to allow the SAT to achieve a stable temperature before energizing a second stage of capacity. Likewise, a 45-second delay is used when staging down.

After a compressor is staged off, it may be restarted again after a normal time-guard period of 5 minutes and if the supply-air temperature has fallen below the maximum supply air temperature limit.

The WSHP Open controller provides a status input to monitor the compressor operation. The status is monitored to determine if the compressor status matches the commanded state. This input is used to determine if a refrigerant safety switch or other safety device has tripped and caused the compressor to stop operating normally. If this should occur, an alarm will be generated to indicate the faulted compressor condition. Also, if auxiliary heat is available (see below), the auxiliary heat will operate to replace the reverse cycle heating and maintain the space temperature as required.

**Auxiliary heat** — The WSHP Open controller can control a two-position, modulating water, or steam valve connected to a coil on the discharge side of the unit and supplied by a boiler or a single-stage ducted electric heater in order to maintain the desired heating set point. Should the compressor capacity be insufficient or a compressor failure occurs, the auxiliary heat will be used. Unless the compressor fails, the auxiliary heat will only operate to supplement the heat provided by the compressor if the space temperature falls more than one degree below the desired heating set point (the amount is configurable). The heat will be controlled so the SAT will not exceed the maximum heating SAT limit.

The same conditions required for reverse cycle heating must be true in order for the auxiliary heat algorithm to run.

Auxiliary modulating hot water/steam heating reheat — The control can modulate a hot water or steam valve connected to a coil on the discharge side of the unit and supplied by a boiler in order to maintain the desired heating set point should the compressor capacity be insufficient or a compressor failure occurs. Unless a compressor fault condition exists, the valve will only operate to supplement the heat provided by the compressor if the temperature falls more than one degree below the desired heating set point. The valve will be controlled so the SAT will not exceed the maximum heating SAT limit.

Two-position hot water/steam heating reheat — The control can operate a two-position, normally open (NO) or normally closed (NC), hot water or steam valve connected to a coil on the discharge side of the unit and supplied by a boiler in order to maintain the desired heating set point should the compressor capacity be insufficient or a compressor failure occurs. Unless a compressor fault condition exists, the valve will only open to supplement the heat provided by the compressor if the space temperature falls more than one degree below the desired heating set point. The valve will be controlled so the SAT will not exceed the maximum heating SAT limit. The heat stage will also be subject to a 2-minute minimum OFF time to prevent excessive valve cycling.

Single-stage electric auxiliary heat — The control can operate a field-installed single stage of electric heat installed on the discharge side of the unit in order to maintain the desired heating set point should the compressor capacity be insufficient or a compressor failure occurs. Unless a compressor fault condition exists, the heat stage will only operate to supplement the heat provided by the compressor if the space temperature falls more than one degree below the desired heating set point. The heat stage will be controlled so the SAT will not exceed the maximum heating SAT limit. The heat stage will also be subject to a 2-minute minimum OFF time to prevent excessive cycling.

## **Indoor air quality (IAQ) and demand controlled ventilation (DCV)**

If the optional indoor air quality sensor is installed or the network input "System Space AQ" is utilized, the WSHP Open controller can maintain indoor air quality via a modulating OA damper providing demand controlled ventilation. The control operates the modulating OA damper

during occupied periods. The control monitors the CO<sub>2</sub> level and compares it to the configured set points, adjusting the ventilation rate as required. The control provides proportional ventilation to meet the requirements of ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) specifications by providing a base ventilation rate and then increasing the rate as the CO<sub>2</sub> level increases. The control will begin to proportionally increase ventilation when the CO<sub>2</sub> level rises above the start ventilation set point and will reach the full ventilation rate when the CO<sub>2</sub> level is at or above the maximum set point. A user-configurable minimum damper position ensures that proper base ventilation is delivered when occupants are not present. The IAQ configurations can be accessed through the configuration screen. The following conditions must be true in order for this algorithm to run:

- Damper control is configured for DCV.
- The fire/smoke input and shutdown modes are inactive.
- Fan status is true (if option is enabled).
- The unit is in an occupied mode.
- The IAQ sensor reading is greater than the DCV start control set point.

The control has four user adjustable set points: DCV start control set point, DCV maximum control set point, minimum damper position, and DCV maximum damper position.

**NOTE:** In order for the damper to maintain proper base ventilation, the fan must be configured to operate as a ventilation damper, the fan must be configured to operate in either Continuous or Always On mode.

**Two-position OA damper** — The control can be configured to operate a ventilation damper in a two-position ventilation mode to provide the minimum ventilation requirements during occupied periods.

## Dehumidification

The WSHP Open controller will provide occupied and unoccupied dehumidification only on units that are equipped with the modulating hot water reheat option (HWR). This function requires an accessory space relative humidity sensor. When using a relative humidity sensor to control dehumidification during occupied or unoccupied times, the dehumidification set points are used accordingly. Additionally, the network input point "System Space RH" may also be used in place of the hard wired relative humidity (RH) sensor. When the indoor relative humidity becomes greater than the dehumidification set point, a dehumidification demand will be acknowledged. Once acknowledged, the dehumidification output will be energized, bringing on the supply fan (medium speed), mechanical cooling, and the integral hot water reheat coil. The controls will engage cooling mode and waste heat from the compressor cooling cycle will be returned to the reheat coil simultaneously, meaning that the reversing valve is causing the compressor to operate in the cooling mode. Keep in mind that during cooling mode the unit cools, dehumidifies and disables the HWR coil. However, once the call for cooling has been satisfied and there is still a call for dehumidification, the unit will continue to operate using the reheat mode and HWR coil.

## Waterside economizer

The WSHP Open controller has the capability of providing modulating or two-position water economizer operation (for a field-installed economizer coil mounted to the entering air side of the unit and connected to the condenser water loop) in order to provide free cooling (or preheating) when water conditions are optimal. Water economizer settings can be accessed through the equipment status screen. The following conditions must be true for economizer operation:

- SAT reading is available.
- EWT reading is available.
- If occupied, the SPT is greater than the occupied cooling set point or less than the occupied heating set point and the condenser water is suitable.
- Space temperature reading is valid.
- If unoccupied, the SPT is greater than the unoccupied cooling set point or less than the unoccupied heating set point and the condenser water is suitable.

**Modulating water economizer control** — The control has the capability to modulate a water valve to control condenser water flowing through a coil on the entering air side of the unit.

**Cooling** — The purpose is to provide an economizer cooling function by using the water loop when the entering water loop temperature is suitable (at least 5° F below space temperature). If the water loop conditions are suitable, then the valve will modulate open as required to maintain a supply air temperature that meets the load conditions. Should the economizer coil capacity alone be insufficient for a period greater than 5 minutes, or should a high humidity condition occur, then the compressor will also be started to satisfy the load. Should the SAT approach the minimum cooling SAT limit, the economizer valve will modulate closed during compressor operation.

**Heating** — Additionally, the control will modulate the water valve should the entering water loop temperature be suitable for heating (at least 5° F above space temperature) and heat is required. The valve will be controlled in a similar manner except to satisfy the heating requirement. Should the economizer coil capacity alone be insufficient to satisfy the space load conditions for more than 5 minutes, then the compressor will be started to satisfy the load. Should the SAT approach the maximum heating SAT limit, the economizer valve will modulate closed during compressor operation.

**Two-position water economizer control** — The control has the capability to control a NO or NC, two-position water valve to control condenser water flow through a coil on the entering air side of the unit.

**Cooling** — The purpose is to provide a cooling economizer function directly from the condenser water loop when the entering water loop temperature is suitable (at least 5° F below space temperature). If the optional coil is provided and the water loop conditions are suitable, then the valve will open to provide cooling to the space when required. Should the capacity be insufficient for a period greater than 5 minutes, or should a high humidity condition occur, then the compressor will be started to satisfy the load. Should the SAT reach the minimum cooling SAT

limit, the economizer valve will close during compressor operation.

**Heating** — Additionally, the economizer control will open the water valve should the entering water loop temperature be suitable for heating (at least 5° F above space temperature) and heat is required. The valve will be controlled in a similar manner except to satisfy the heating requirement. Should the coil capacity be insufficient to satisfy the space load for more than 5 minutes, then the compressor will be started to satisfy the load. Should the SAT reach the maximum heating SAT limit, the economizer valve will close during compressor operation.

**Demand limit** — The WSHP Open controller has the ability to accept three levels of demand limit from the BACnet network. In response to a demand limit, the unit will decrease its heating set point and increase its cooling set point to widen the range in order to immediately lower the electrical demand. The amount of temperature adjustment in response is user adjustable for both heating and cooling and for each demand level. The response to a particular demand level may also be set to zero.

**Power failure restart delay** — The control provides a delay when recovering from a power failure or shutdown mode or when transitioning from unoccupied to occupied mode in order to prevent excessive demand when many units start simultaneously. Each unit can be user configured for a unique delay between 0 and 600 seconds. The factory programmed default delay is 60 seconds.

**Fire/smoke detector alarm** — The control monitors the voltage input to J1-9 to detect if a smoke detector or fire detector NC contact has opened, indicating an alarm condition. The control will verify the presence of 24 vac on this input. If the input should open at any time, an alarm will be generated after 3 seconds and the equipment (fan, compressor, auxiliary heat and damper) will immediately shut down.

**Space temperature alarms** — The control provides the ability to generate an alarm whenever the space temperature exceeds the alarm set point. A separate occupied hysteresis and fixed unoccupied high and low alarm set points are provided. The control provides a 5-minute alarm delay during unoccupied periods. During occupied periods, the control uses the occupied temperature set point and applies the hysteresis value to determine the alarm set points. Whenever an occupancy transition from unoccupied to occupied occurs or the occupied temperature set points are changed causing an alarm condition to occur, the control will automatically calculate an alarm delay (equivalent to the configured delay time in minutes / degree F times the temperature error that occurred plus 15 minutes). This will prevent nuisance alarms whenever an occupancy change occurs and allows time for the unit to correct an alarming temperature condition.

**Condenser water temperature alarm** — The control has 4 configurable alarm limits for condenser water temperature. The control will verify that the water temperature is within operating range (between high and low limits) for the specific operating mode (heating or cooling) before energizing the compressor. Once the compressor is started, the condenser water temperature is further monitored to

verify that it is within limits to insure sufficient water is flowing through the coil. Should the leaving water temperature rise above or fall below the appropriate limits, an alarm is generated and the compressor will be shut down if the condition occurs for more than 15 seconds.

**Supply air temperature alarm** — The control has two configurable alarm limits for supply air temperature. The control will verify that the supply air temperature is within operating range (between high and low limits) whenever the compressor or auxiliary heat is operating. Should the air temperature rise above or fall below the appropriate limits, an alarm is generated if the condition occurs for more than 5 minutes.

**High condensate/overflow alarm** — The control will monitor a discrete input to determine the state of a condensate level switch. The input can be configured to alarm on either an open or closed switch condition. Should this input be in an alarm state, the control will start a timer and after the timer exceeds a configurable 'Condensate Overflow Alarm Delay' limit (10 second default), the control will generate an alarm and the unit will disable the compressor and fan outputs.

**Fan status alarm (optional)** — The control generates a fan status alarm if the fan status input detects that the fan is OFF after any fan speed output has been enabled. A 30-second alarm delay is used to allow the fan to start operation before an alarm condition is detected. The control monitors the fan output and if the fan is operating at any speed, the fan status must detect the fan is operating.

**Compressor status alarm** — The control generates a compressor failure alarm if the compressor status input detects that the compressor is OFF after the compressor output has been energized. A 6-minute alarm delay is used to allow the compressor to start (prevents alarms due to time-gard operation) before an alarm condition is detected. The control monitors the compressor output and if the compressor output is energized, the compressor status input must detect the compressor operation.

**Filter status alarm** — The control provides the ability to generate a dirty filter alarm after the number of fan run hours exceeds a configurable filter alarm timer limit. The control monitors the fan output and if the fan is operating at any speed, it accumulates run time. Should the fan run time hours exceed the configurable limit, an alarm is generated. To reset the alarm timer after the alarm has been generated, a 'Reset Filter Alarm' input is provided. The filter alarm can be disabled by setting the 'Filter Alarm Timer Delay' to zero (factory default).

**Indoor air quality alarm** — The control provides the ability to generate a high CO<sub>2</sub> level alarm during occupied periods whenever the CO<sub>2</sub> sensor value exceeds the user adjustable limit. Whenever an occupancy transition from unoccupied to occupied occurs, or the occupied alarm limit is changed to a value that causes an alarm condition to occur, the control will automatically calculate an alarm delay (equivalent to the configured delay time in minutes / ppm times the error that occurred + 15 minutes). This prevents nuisance alarms from occurring when occupancy changes or the set point is changed. The IAQ alarm can be disabled by setting 'Occupied High IAQ Alarm Limit' to zero.

# Controls (cont)



**Relative humidity alarm** — The control provides the ability to generate an alarm whenever the space relative humidity exceeds the alarm set point. Separate occupied and unoccupied high humidity alarm set points are provided. The control provides a 5-minute alarm delay during unoccupied periods. During occupied periods, the controller uses the occupied high RH alarm limit. Whenever an occupancy transition from unoccupied to occupied occurs, or the occupied high alarm limit is lowered causing an alarm condition to occur, the control will automatically calculate an alarm delay (equivalent to the configured delay time in minutes / % RH times the humidity error condition that occurred + 15 minutes). This will prevent nuisance alarms whenever an occupancy change occurs and allows time for the unit to correct an alarming humidity condition.

**Condenser water power failure restart delay** — The control generates a condenser water linkage failure alarm if the linkage fails after once being active. The linkage status is monitored and if it fails to be updated from the loop controller, then a condenser water linkage alarm is generated. A 6-minute alarm delay is provided to prevent false alarm from occurring.

NOTE: This alarm can only be reset by re-establishing linkage and correcting the condition that caused the linkage failure to occur or by setting the shutdown point to active momentarily.

**Airside linkage failure alarm** — If airside linkage is active, the control generates an airside linkage failure alarm should linkage fail after once being active. The linkage status is monitored and if it fails to be updated from the master zone controller, then an airside linkage alarm is generated. A 6-minute alarm delay is provided to prevent false alarm from occurring.

NOTE: This alarm can only be reset by re-establishing linkage and correcting the condition that caused the linkage failure to occur or by setting the shutdown point to active momentarily.

**OAT sensor alarm** — If network OA temperature is active, the control generates an OAT sensor failure alarm if the value of OAT fails to be updated through the network after once being active. The update status is monitored and if it fails to be updated, an OAT sensor alarm is generated. An alarm delay (approximately 1 hour) is provided to prevent false alarm from occurring while minimizing the required update rate for OAT.

NOTE: This alarm can be reset by setting the shutdown point to active momentarily.

**SPT sensor alarm** — If SPT sensor is active, the control generates an SPT sensor failure alarm if the SPT sensor fails to communicate with the control for 5 minutes or greater. The update status is monitored and should it fail to be updated, then a SPT sensor alarm is generated.

**ECM control** — The ECM fan is controlled by an interface board that converts thermostat inputs and field-selectable CFM settings to signals used by the ECM motor controller. To take full advantage of the the ECM motor features, a multi-stage thermostat should be used (2-stage heat/2-stage cool or 3-stageheat/2-stage cool). The controller includes logic and a relay to control HWG functions.

NOTE: Power must be off to the unit for at least 3 seconds before the ECM motor will recognize a speed change. The motor will recognize a change in the CFM adjust or dehumidification mode settings while the unit is powered.

There are 4 different airflow settings from lowest airflow rate to highest.

# Guide specifications



## Single-Stage Water Source Heat Pumps with Puron® Refrigerant (R-410A)

### HVAC Guide Specifications

Size Range: **6,300 to 77,100 Btuh**

**Cooling Capacity**

**4,800 to 85,800 Btuh**

**Heating Capacity**

Carrier Model Number: **50PSH, 50PSV, 50PSD**

### Part 1 — General

#### 1.01 SYSTEM DESCRIPTION

- A. Single package horizontally and vertically mounted water source heat pumps with Puron® refrigerant (R-410A) and electronic controls.
- B. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the guide specifications that follow.

#### 1.02 QUALITY ASSURANCE

- A. All equipment listed in this section must be rated and certified in accordance with AHRI/ISO and ETL listed to UL standard 1995. The units shall have AHRI/ISO and ETL labels.
- B. All units shall be fully quality tested by factory run testing under normal operating conditions and water flow rates as described herein. Quality control system shall automatically perform via computer: triple leak check, pressure tests, evacuate and accurately charge system, perform detailed heating and cooling mode tests, and quality cross check all operational and test conditions to pass/fail data base. A detailed report card will ship with each unit displaying all test performance data.  
NOTE: If unit fails on any cross check, system shall not allow unit to ship.
- C. Serial numbers will be recorded by factory and furnished to contractor on report card for ease of unit warranty status. Units tested without water flow are not acceptable. Units shall be prewired and pre-charged in factory.

### Part 2 — Product

#### 2.01 EQUIPMENT

##### A. General:

Units shall be supplied completely factory built for an entering water temperature range from 60 to 95 F as standard. Units may consist of rotary or scroll compressor, PSC (permanent split capacitor) or ECM (electronically controlled motor) fan motor and blower and refrigerant circuit as indicated on the equipment schedule. Equivalent units from other manufacturers can be proposed provided approval to bid is given 10 days prior to bid closing.

##### B. Unit Cabinets:

###### 1. Horizontal Units:

- a. Horizontal units shall have one of the following airflow arrangements: left inlet/

right discharge; right inlet/left discharge; left inlet/back discharge; or right inlet/back discharge as shown on the plans.

- b. Horizontal units must have the ability to be field convertible from side to back or back to side discharge with no additional parts or unit structure modification. Units will have factory-installed hanger brackets with rubber isolation grommets packaged separately.
2. Vertical Units:  
Vertical units shall have one of the following air flow arrangements: left return/top discharge, right return/top discharge, left return/bottom discharge, right return/bottom discharge as shown on the plans.
  3. If units with these arrangements are not used, the contractor is responsible for any extra costs incurred by other trades.
  4. All units (horizontal and vertical) must have a minimum of three access panels for serviceability of compressor compartment. Units having only one access panel to compressor, heat exchangers, expansion device, or refrigerant piping shall not be acceptable.
  5. Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. Unit insulation must meet these stringent requirements or unit(s) will not be accepted.
  6. Cabinets shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring.
  7. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules.
  8. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.
  9. All horizontal units to have factory-installed 1 in. (25.4 mm) discharge air duct collars, 1 in. (25.4 mm) filter rails with 1 in. (25.4 mm) filters factory-installed, and factory-installed unit-mounting brackets. discharge air duct collars. Vertical units to have field-installed discharge air duct collar, shipped loose and 1 in. (25.4 mm) filter rails with 1 in. (25.4 mm) filters factory-installed. If units with these factory-installed provisions are not used, the contractor is responsible for any extra costs to field install these provisions, and/or the extra costs for the subcontractor to install these provisions.

## C. Compressor:

1. Compressor section interior surfaces shall be lined with 1/2 in. thick, dual density, 1<sup>3</sup>/<sub>4</sub> lb per cubic ft acoustic type fiberglass insulation. Air-handling section interior surfaces shall be lined with 1/2 in. thick, single density, 1<sup>3</sup>/<sub>4</sub> lb per cubic ft foil-backed fiber insulation for ease of cleaning.
2. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the airstream. Units without foil-backed insulation in the air-handling section will not be accepted.
3. The compressor shall have a dual level vibration isolation system.
4. The compressor will be mounted on computer-selected vibration isolation springs to a large heavy gage compressor mounting tray plate, which is then isolated from the cabinet base with rubber grommets for maximized vibration attenuation.
5. Compressor shall be located in an insulated compartment away from airstream to minimize sound transmission.
6. Compressor shall have thermal overload protection.
7. The heat pumps shall be fabricated from heavy gage G90 galvanized steel with powder coat paint finish. Both sides of the steel shall be painted for added protection.
8. All units must have an insulated panel separating the fan compartment from the compressor compartment.
9. Units with the compressor in the airstream are not acceptable.

## D. Fan and Motor Assembly:

1. Blower shall have inlet rings to allow removal of wheel and motor from one side without removing housing.
2. The fan motor shall be 3-speed, permanently lubricated, PSC (permanent split capacitor) type with internal thermal overload protection.
3. The fan motor on small and medium size units (006-048) shall be isolated from the fan housing by a torsionally flexible motor mounting system with rubber grommets to inhibit vibration induced high noise levels associated with hard wire belly band motor mounting.
4. The fan motor on larger units (060 and 070) shall be isolated with flexible rubber type grommets only.
5. The motor shall be permanently lubricated and have thermal overload protection.
6. A special dehumidification mode shall be provided to allow lower airflows in cooling for better dehumidification. The dehumidification

mode shall be selectable via a jumper on the control board or may be controlled externally from a humidistat.

7. Airflow/static pressure rating of the unit shall be based on a wet coil and a clean filter in place. Ratings based on a dry coil and/or no filter, or on an ESP (external static pressure) less than 0.50 in. wg shall NOT be acceptable.

## E. Refrigerant Circuit:

1. All units shall contain a Puron® refrigerant (R-410A) sealed circuit including a high-efficiency Copeland UltraTech™ single-stage compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant to air heat exchanger, reversing valve, coaxial (tube-in-tube) refrigerant to water heat exchanger, and safety controls, including a high-pressure switch, low-pressure switch (loss of charge), water coil low temperature sensor, and air coil low temperature sensor.
2. A reversible heat pump filter drier shall be factory-installed that operates in either flow direction with low pressure drop. The filter drier core offers optimum water and acid removal abilities in addition to excellent filtration. When flow reverses, dirt already collected shall remain in the filter drier.
3. Access fittings shall be factory-installed on high and low pressure refrigerant lines to facilitate field service.
4. Refrigerant metering shall be accomplished by thermostatic expansion valve only.
5. Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 625 psig (4309 kPa) refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 625 psig (4309 kPa) working refrigerant pressure and 500 psig (3445 kPa) working water pressure.
6. Refrigerant to water heat exchanger shall be "electro-coated" with a low cure cathodic epoxy material a minimum of 0.4 mils thick (0.4 to 1.5 mils range) on all surfaces. The black colored coating shall provide a minimum of 1000 hours salt spray protection per ASTM B117-97 on all external steel and copper tubing. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 160 in-lb. (184 kg-cm) direct (ASTM D2794-93).

#### F. Drain Pan:

1. The drain pan shall be constructed of 304 stainless steel to inhibit corrosion. This corrosion protection system shall meet the stringent 1000-hour salt spray test per ASTM B117. If plastic type material is used, it must be HDPE (high-density polyethylene) to avoid thermal cycling shock stress failure over the lifetime of the unit.
2. Drain pan shall be fully insulated.
3. Drain outlet (3/4-in. outlet size) shall be located at pan as to allow complete and unobstructed drainage of condensate. Drain outlet for horizontal units shall be connected from pan directly to FPT fitting. No hidden internal tubing extensions from pan outlet extending to unit casing (that can create drainage problems) will be accepted.
4. The unit as standard will be supplied with solid-state electronic condensate overflow protection. A mechanical float switch will be used with the WSHP Open multiple protocol controller option.
5. Vertical units shall be furnished with a PVC slip condensate drain connection and an internal factory-installed condensate trap. If units without an internal trap are used, the contractor is responsible for any extra costs to field install these provisions, and/or the extra costs for the subcontractor to install these provisions.

#### G. Filter:

1. Units shall have a factory-installed 1 in. wide filter bracket for filter removal from either side. Units shall have a 1 in. thick throwaway type fiberglass filter.
2. The contractor shall purchase one spare set of filters and replace factory shipped filters on completion of start-up.
3. Filters shall be standard sizes. If units utilize non-standard filter sizes, then the contractor shall provide 12 spare filters for each unit.

#### H. Thermostatic Expansion Valve:

1. Expansion valves shall be dual port balanced types with external equalizer for optimum refrigerant metering.
2. Units shall be designed and tested for operating ranges of entering water temperatures from 20 to 120 F (-6.7 to 48.9 C).
3. Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low temperature thermostat must be provided to prevent overcooling an already cold room.

#### I. Controls and Safeties:

##### 1. Electrical:

- a. A control box shall be located within the unit compressor compartment and shall contain a 50 va transformer, 24-volt activated, 2 or 3-pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation.
- b. Reversing valve and fan motor wiring shall be routed through this electronic controller.
- c. Units shall be name-plated for use with time-delay fuses or HACR circuit breakers. Unit controls shall be 24-volt and provide heating or cooling as required by the remote thermostat/sensor.

##### 2. Unit Controls:

- a. Safety controls including a high-pressure switch, a low-pressure sensor, and a low water and low air temperature sensor. Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service.
- b. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit. The lockout shall be reset at the thermostat or at the contractor-supplied disconnect switch.
- c. Units which may be reset only at the disconnect switch only shall not be acceptable.

##### 3. Complete C Controls:

The standard Complete C electronic control system shall interface with a heat pump (Y,O) wall thermostat (mechanical or electronic). The control system microprocessor board shall be specifically designed to protect against building electrical system noise contamination, EMI, and RFI interference. The control system shall have the following features:

- a. 50 va transformer.
- b. Performance Monitor (PM). The PM warns when the heat pump is running inefficiently.
- c. Anti-short cycle time delay on compressor operation time delay shall be 5 minutes minimum.
- d. Random start on power up mode. The control features a 5 to 80 second random start upon power up. The random start delay will be present after a control power up and after returning from night setback or emergency shutdown modes.
- e. Low voltage protection.
- f. High voltage protection.
- g. Unit shutdown on high or low refrigerant pressures.
- h. Unit shutdown on low water temperature.

- i. Water coil freeze protection (selectable for water or antifreeze).
- j. Air coil freeze protection (check filter switch).
- k. Condensate overflow shutdown.
- l. Option to reset unit at thermostat or disconnect. Fault type shall be retained in memory if reset at thermostat.
- m. Automatic intelligent reset. Unit shall automatically reset 5 minutes after trip if the fault has cleared. Should a fault reoccur 3 times sequentially, lockout requiring manual reset will occur.
- n. Ability to defeat time delays for servicing.
- o. Light-emitting diodes (LED) to indicate high pressure, low pressure, low voltage, high voltage, air/water freeze protection, condensate overflow and control status.
- p. The low-pressure switch SHALL NOT be monitored for the first 90 seconds after a compressor start command to prevent nuisance safety trips.
- q. Remote fault type indication at thermostat.
- r. Selectable 24-v or pilot duty dry contact alarm output.
- s. 24-v output to cycle a motorized water valve with compressor contactor.
- t. Electric heat output to control two stages of electric heat (emergency heat).
- u. Service test mode for troubleshooting and service.
- v. Unit Performance Sentinel (UPS). The UPS warns when the heat pump is running inefficiently.

Units not providing the 8 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil freeze, water coil freeze, and condensate overflow protections will not be accepted.

#### 4. Deluxe D Controls:

Optional electronic Deluxe D control shall have all the features of the Complete C control with the following additional features:

- a. 75 va transformer.
- b. A removable thermostat connector.
- c. Random start on return from night setback.
- d. Intelligent reversing valve operation for extended life and quiet operation.
- e. Night setback control from low temperature thermostat, with 2-hour override initiated by a momentary signal from the thermostat.
- f. Dry contact night setback output for digital night setback thermostats.
- g. Ability to work with heat/cool (Y, W) thermostats.

- h. Ability to work with heat pump thermostats using O or B reversing valve control.
- i. Single grounded wire to initiate night setback, or emergency shutdown.
- j. Boilerless system control can switch automatically to electric heat at low loop water temperature.
- k. Dehumidistat input providing fan control for dehumidification operation via the Ideal-Humidity™ system.
- l. Multiple units connected to one sensor providing communication for up to 3 water source heat pumps.
- m. Selection of boilerless changeover temperature set point.
- n. Compressor relay staging for dual stage units or in master/slave applications.

Units not having automatic low sensible heat ratio cooling will not be accepted; as an alternate, a hot gas reheat coil may be provided with control system for automatic activation.

#### 5. WSHP Open Multiple Protocol Control:

- a. Units shall have all the features above (either C or D boards) and the state of the art WSHP Open multiple protocol interface board. All point objects will have the ability to be viewed in the BACview<sup>6</sup> Handheld user interface. This will permit all units to be daisy chain connected by a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

- 1) space temperature
- 2) leaving water temperature
- 3) discharge air temperature
- 4) command of space temperature set point
- 5) cooling status
- 6) heating status
- 7) low temperature sensor alarm
- 8) high pressure switch alarm
- 9) fan on/off position of space thermostat
- 10) unoccupied/occupied command
- 11) cooling demand
- 12) heating demand
- 13) fan "ON/AUTO" command
- 14) fault prevention with auto reset
- 15) itemized fault code viewed with BACview interface

- b. Additional WSHP Open multiple protocol control features shall include:

- 1) two-position OA damper
- 2) modulating OA damper with DCV
- 3) auxiliary modulating hot water/steam heating
- 4) two-position hot water/steam heating
- 5) single stage electric auxiliary heat
- 6) auto fan speed control (heating/cooling)

- 7) power fail restart delay
- 8) dehumidification
- 9) modulating water economizer control
- 10) two-position water economizer control

6. PremierLink™ Controller:

This optional control will function with CCN (Carrier Comfort Network®) and ComfortVIEW™ software. It shall also be compatible with ComfortLink controllers. It shall be ASHRAE 62-99 compliant and Internet ready. It shall accept a CO<sub>2</sub> sensor in the conditioned space and be demand controlled ventilation (DCV) ready. The communication rate must be 38.4K or faster. It shall include an integrated economizer controller.

7. LonWorks Interface System:

Units shall have all features listed above (either Complete C or Deluxe D) and the control board shall be supplied with a LonWorks interface board, which is LONMark certified. This will permit all units to be daisy chained via a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

- a. space temperature
- b. leaving-water temperature
- c. discharge-air temperature
- d. command of space temperature set point
- e. cooling status
- f. heating status
- g. low temperature sensor alarm
- h. low pressure sensor alarm
- i. high pressure switch alarm
- j. condensate sensor alarm
- k. high/low voltage alarm
- l. fan "ON/AUTO" position of space thermostat
- m. unoccupied/occupied command
- n. cooling command
- o. heating command
- p. fan "ON/AUTO" command
- q. fault reset command
- r. itemized fault code revealing reason for specific shutdown fault (any one of 7)

This option also provides the upgraded 75 va control transformer with load side short circuit and overload protection via a built in circuit breaker.

J. Piping:

1. Supply and return water connections shall be copper FPT fittings and shall be securely mounted flush to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench.

2. All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature.

K. Solid-State Permanent Split Capacitor (PSC) Fan Control Board:

1. Airflow selection shall be accomplished via 3 jumper switches on the PSC control board. Actual airflow shall be indicated by the cfm LED with each 100 cfm being represented by one flash of the LED.
2. Airflow shall be automatically maintained ( $\pm 5\%$ ) by the PSC motor regardless of external static pressure up to its maximum output capacity.
3. A jumper shall allow selection of a special dehumidification mode, which reduces airflow in cooling by 25% to increase the latent capacity of the unit. A terminal shall be provided on the control board to allow an external humidistat to activate dehumidification mode.

L. Remote Service Sentinel (Complete C or Deluxe D):

1. Solid-state control system shall communicate with thermostat to display (at the thermostat) the unit status, fault status, and specific fault condition, as well as retrieve previously stored fault that caused unit shutdown.
2. The remote service sentinel allows building maintenance personnel or service personnel to diagnose unit from the wall thermostat.
3. The control board shall provide a signal to the thermostat fault light, indicating a lockout.
4. Upon cycling the G (fan) input 3 times within a 60-second time period, the fault light shall display the specific code as indicated by a sequence of flashes. A detailed flashing code shall be provided at the thermostat LED to display unit status and specific fault status such as over/under voltage fault, high pressure fault, low pressure fault, low water temperature fault, condensate overflow fault, etc.
5. Units that do not provide this remote service sentinel shall not be acceptable.

M. Special Features:

1. Cupronickel coaxial water-to-refrigerant heat exchangers are available for higher corrosion protection.
2. Tin-coated air side coil provides protection from corrosion in coastal areas, marine applications, or other areas where corrosion may be an issue.
3. The sound attenuation (mute) package consists of high technology sound attenuating materials strategically applied to the cabinet, in addition to the standard system, to further dampen sound.

4. Extended range is available for units operating with entering water temperatures below dew point with use of antifreeze. Operation below 60 F EWT (entering water temperature) requires optional insulated water/refrigerant circuit. Extended entering water temperatures range from 20 to 120 F. Appropriate levels of proper antifreeze solution should be used in systems with leaving water temperatures of 40 F or below and the JW3 jumper should be clipped. JW3 should never be clipped for standard range equipment or systems without antifreeze.
5. A two-way motorized water control valve shall operate in conjunction with the compressor to shut off or turn on water to the unit. Motorized water valve shall offer 3.5 watt coil, 24 volt, 50/60 Hz, 740 amps inrush, .312 amps holding. Motorized water valve is a slow-closing (ON/OFF) quiet operation with 24 vac, end switch and standard normally closed.
6. Water circuit options shall provide internally mounted 2.5 or 3.0 gpm per ton automatic flow regulating valves.
7. The hot water generator coil and high temperature switch shall generate hot water within the unit.
8. The permanent split capacitor (PSC) high-static blower motor shall increase unit capacity through the use of a high-static blower motor.
9. The electronically commutated motor (ECM) shall provide soft starting, maintain constant cfm over its static operating range and provide airflow adjustment on its control board.
10. Modulating hot water reheat (HWR) is composed of a supply air sensor, motorized valve, proportional controller, loop pump, and hydronic coil.
11. Aquazone™ Thermostat Controls:
  - a. Edge® Pro 7-day programmable thermostat offers 2-stage heat, 2-stage cool, remote contact input, remote sensor capability, pre-occupancy purge, soft start, manual/auto changeover, 4 settings per day, 24 vac, backlit LCD, keypad lockout, no batteries required, 5-minute compressor protection, never lost memory, 3 security levels, and temperature display in degrees F or C.
  - b. Comfort™ Pro 7-day programmable thermostat offers 2-stage heat, 2-stage cool, auto changeover, 4 settings per day, 24 vac, backlit LCD, keypad lockout, 5-minute compressor protection, never lost memory, 3 security levels, and temperature display in degrees F or C.
  - c. Comfort™ Pro 7-day non-programmable thermostat offers 2-stage heat, 2-stage cool, auto changeover, backlit display, keypad lockout, 5-minute compressor protection, dual setpoint with adjustable deadband, never lost memory, 3 security levels, and temperature display in degrees F or C.
12. Loop controller with six stages (2 stages for heating and 4 stages for heat rejection) is available.
13. The 2 in. filter frame with door (enclosure) is available in place of the standard 1-in. return air filter to enhance the filtration system of the water source heat pump. The 2-in. filter frame with filter access door does not include filters.
14. Fire-rated hose kits include a fixed MPT on one end and a swivel with an adapter on the other end. Hose kits can be either stainless steel or galvanized.
15. Ball valves (brass body) shut off and balance water flow. Valves are available with memory, memory stop, and pressure temperature ports.
16. Y strainers (bronze body) are “Y” type configuration with a brass cap and stainless steel strainer screen. Maximum operating pressure rating of strainers is 450 psi.
17. Hose kit assemblies include a ported ball valve with pressure temperature (P/T) plug ports and flexible stainless steel hose with swivel and nipple. Return hose includes a ball valve, preset measure flow (gpm) with two P/T ports, flexible stainless steel hose with a swivel and nipple.
18. Multiple-protocol WSHP Open controller remote sensors for Aquazone flush-mount thermostats and DDC control options. Only Carrier sensors can be used with the WSHP Open controller. Sensors are available as follows:
  - a. SPT Standard offers space temperature sensor with communication port.
  - b. SPT Plus offers space temperature sensor with set point adjust, local override with indicating light and communication port.
  - c. SPT Pro offers space temperature sensor with LCD display, set point adjust, local override, alarm icon, outside air, and unit status with heating and cooling set points.
  - d. SPT Pro+ offers space temperature sensor with LCD display, set point adjust, local override, alarm icon, outside air, unit status with heating and cooling set points, and fan speed control.
19. PremierLink™ accessories provide a fully integrated DDC system. Accessories include supply air temperature sensors, communicating room sensors, CO<sub>2</sub> sensors, and linkage thermostats.
20. An Aquazone™ system control panel as specified in 50RLP Product Data (525-00040) is available.

21. LON wall sensors are available in 3 models: sensor only, sensor with status override indicator, and sensor with set point, status adjustment override, and digital LCD display.
22. A field-installed electric duct heater shall be available for use for auxiliary/emergency heat.

The auxiliary or emergency heat can also be used in boilerless applications.

23. A UC Open XP loop controller shall be available with six stages (2 stages for heating and 4 stages for cooling).





